

SECTION A. DETAILED STATISTICAL TABLES

	<i>Page</i>
TABLE NOTES	7
REPORTING UNITS	7
COMPANY SIZE	7
CURRENT AND CONSTANT DOLLARS	7
DISCLOSURE AND SUPPRESSION OF STATISTICS	7
GEOGRAPHIC STATISTICS	7
IMPUTATION	7
INDUSTRY CLASSIFICATION	7
PERCENTAGES	8
ROUNDING.....	8
LIST OF TABLES	9
TABLES	15

TABLE NOTES

These notes pertain to the tables in this section and in section B except as noted in footnotes and other explanatory information noted at the end of specific tables.

REPORTING UNITS

The basic reporting unit is the company, firm, or enterprise that included all establishments under common ownership or control. All R&D expenditures and all scientists and engineers of each company were classified into a single SIC code and size category.

COMPANY SIZE

Companies are categorized by total number of domestic employees. The following are the six size classes used in this report:

- fewer than 500 employees;
- 500 to 999 employees;
- 1,000 to 4,999 employees;
- 5,000 to 9,999 employees;
- 10,000 to 24,999 employees; and
- 25,000 or more employees.

CURRENT AND CONSTANT DOLLARS

Statistics in all tables are reported in current dollars. Constant dollars are also presented in the summary tables (A-1, A-26, A-27, and A-28). Gross domestic product (GDP) implicit price deflators were used to convert current to constant dollars.

DISCLOSURE AND SUPPRESSION OF STATISTICS

Title 13 of the United States Code prohibits publication or release of data or statistics that may reveal information about individual companies. Therefore, the

data in some table cells may have been deleted and replaced with "(D)." This occurs when a small number of companies account for a large percentage of the estimate in a particular data cell. Although publication of certain cells may be withheld, the estimates in the cells are always included in totals. The tables most often affected by this rule are those that contain data on Federal support for R&D performance.

GEOGRAPHIC STATISTICS

The statistics cover only those operations located in the 50 states and the District of Columbia. Statistics on company-sponsored R&D performed outside the United States by foreign subsidiaries of U.S. domestic companies are included in table A-11 but excluded from all other tables.

IMPUTATION

Missing data are imputed for some data items. Therefore, the statistics in some table cells may be accompanied by the notation "(S)," which indicates that the imputation rate—the percentage of the statistic not reported by respondents and consequently estimated—exceeds 50 percent for that item. In such cases, the estimate may be statistically unreliable. See table B-4 for imputation rates for specific items.

INDUSTRY CLASSIFICATION

One SIC code was assigned to each company. A single SIC code was assigned to multi-establishment companies based on the code that represented the most dominant aggregated activity for that firm in terms of total payroll. Statistics for the following industry groupings are published in this report (SIC codes are shown in parentheses⁵):

- Food, kindred, and tobacco products (20, 21)
- Food and kindred products (20)
- Tobacco products (21)
- Textiles and apparel (22, 23)

⁵The 1997 sample uses the 1987 revision of the SIC system.

Textile mill products (22)	Transportation and utilities (40–42, 44–49)
Apparel (23)	Communications (48)
Lumber, wood products, and furniture (24, 25)	Telephone communications (481)
Lumber and wood products, except furniture (24)	Other communications (482–84, 489)
Furniture and fixtures (25)	Electric, gas, and sanitary services (49)
Paper and allied products (26)	Other transportation and utilities (40–42, 44–47)
Printing, publishing, and allied industries (27)	Trade (50–59)
Chemicals and allied products (28)	Finance, insurance, and real estate (60–65, 67)
Industrial chemicals (281–82, 286)	Services (701, 72, 73, 75–81, 83, 84, 87, 89)
Drugs and medicines (283)	Business services (73)
Other chemicals (284–85, 287–89)	Computer and data processing services (737)
Petroleum refining and extraction (13, 29)	Other business services (731–36, 738)
Rubber products (30)	Health services (80)
Leather and leather goods (31)	Offices and clinics of medical doctors, hospitals, medical and dental labs (801, 806, 807)
Stone, clay, and glass products (32)	Other health services (802–5, 808–9)
Primary metals (33)	Engineering and management services (87)
Ferrous metals and products (331–32, 3398–99)	Engineering, architectural, and surveying (871)
Nonferrous metals and products (333–36)	Research, development, and testing (873)
Fabricated metal products (34)	Other engineering and management services (872, 874)
Machinery (35)	Other services (701, 72, 75–79, 81, 83, 84, 89)
Office, computing, and accounting machines (357)	Other nonmanufacturing industries—agricultural services, forestry, fishing, hunting, and mining (07–12, 14); and construction (15–17)
Other machinery, except electrical (351–56, 358–59)	
Electrical equipment (36)	
Radio and TV receiving equipment (365)	
Communication equipment (366)	
Electronic components (367)	
Other electrical equipment (361–64, 369)	
Transportation equipment (37)	
Motor vehicles and motor vehicles equipment (371)	
Other transportation equipment (373–75, 379)	
Aircraft and missiles (372, 376) ⁶	
Professional and scientific instruments (38)	
Scientific and mechanical measuring instruments (381–82)	
Optical, surgical, photographic, and other instruments (384–87)	
Miscellaneous manufacturing industries (39)	
Other manufacturing industries not elsewhere classified	

⁶Because of the close similarity of their R&D activities, companies primarily engaged in the manufacture of ordnance and accessories, including complete guided missiles, are grouped with companies primarily engaged in the manufacture of aircraft and parts.

PERCENTAGES

Percentages were calculated on the basis of thousands of dollars and may differ from those calculated using the rounded figures shown.

ROUNDING

Because of rounding, details may not add to totals.

LIST OF TABLES

<i>Table</i>	<i>Page</i>
TOTAL FUNDS FOR R&D	
A-1. Trends in industrial R&D performance, by source of funds, in current and constant dollars: 1953–97	15
A-2. Summary data for R&D-performing companies, by detailed industry and size of company: 1996–97	17
A-3. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1987–97	21
A-4. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1997	24
A-5. Total (company, Federal, and other) funds for industrial R&D performance, by industry, size of company, and size of R&D program: 1997	27
A-6. Number of R&D-performing companies, by industry, size of company, and size of R&D program: 1997	30
COMPANY AND OTHER (EXCEPT FEDERAL) FUNDS FOR R&D	
A-7. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1987–97	33
A-8. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1997	36
A-9. Company-financed R&D contracted to outside organizations, by R&D performing companies by industry and size of company: 1991, 1993–97	39
A-10. Number of R&D-performing companies contracting R&D performance to outside organizations and total number of R&D-performing companies, by industry and size of company: 1997	42
A-11. Company-financed R&D performed outside the United States by U.S. R&D-performing domestic companies and their foreign subsidiaries, by industry and size of company: 1987–97	45
A-12. Company-financed industrial R&D performed outside the United States by U.S. R&D- performing domestic companies and their foreign subsidiaries, by country: 1997	48

<i>Table</i>	<i>Page</i>
--------------	-------------

FEDERAL FUNDS FOR R&D

A-13. Federal funds for industrial R&D performance, by industry and size of company: 1987–97	49
A-14. Federal funds for industrial R&D performance, by industry and size of company: 1997	52
A-15. Federal funds for industrial R&D performance, by selected agency and selected industry in selected years: 1977–97	55
A-16. Total number of R&D-performing companies and number reporting Federal R&D funds, by industry and size of company: 1997	57
A-17. Industry-administered federally-funded R&D centers (FFRDCs)—funds by character of work, full-time-equivalent (FTE) R&D scientists and engineers, and total number of employees: 1987–97	60

R&D FUNDS BY SIZE OF COMPANY AND AS A PERCENTAGE OF NET SALES

A-18. Total (company, Federal, and other) funds for industrial R&D performance and number of R&D-performing companies in manufacturing and nonmanufacturing industries, by size of company: 1997	61
A-19. Concentration of total, Federal, and company and other industrial R&D funds and net sales of R&D-performing companies, by size of R&D program: 1987–97	62
A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1996–97	63
A-21. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1987–97	68
A-22. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1987–97	71
A-23. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and ranked by size of R&D program: 1997	74
A-24. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and ranked by size of company-financed R&D program: 1997	77
A-25. Federal industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and ranked by size of federally-financed R&D program: 1997	80

FUNDS FOR BASIC RESEARCH, APPLIED RESEARCH, AND DEVELOPMENT

A-26. Total (company, Federal, and other) funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953–97	83
A-27. Company and other (except Federal) funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953–97	85
A-28. Federal funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953–97	87

<i>Table</i>	<i>Page</i>
A-29. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1995	89
A-30. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1996	92
A-31. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1997	95
A-32. Number of companies conducting industrial basic research and total number of R&D-performing companies, by industry and size of company: 1997	99
A-33. Funds for industrial applied R&D performance, by product field and source of funds: 1997	102
A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997	104
A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997	110

ENERGY AND POLLUTION ABATEMENT R&D

A-36. Total (company, Federal, and other) funds for industrial energy R&D performance, by industry and size of company: 1987–97 and projected 1998	122
A-37. Company and other (except Federal) funds for industrial energy R&D performance, by selected industry: 1987–97 and projected 1998	126
A-38. Federal funds for industrial energy R&D performance, by selected industry: 1987–97 and projected 1998	127
A-39. Total (company, Federal, and other) funds for industrial energy R&D performance, by primary energy source: 1987–97 and projected 1998	128
A-40. Company and other (except Federal) funds for industrial energy R&D performance, by primary energy source: 1987–97 and projected 1998	129
A-41. Federal funds for industrial energy R&D performance, by primary energy source: 1987–97 and projected 1998	130
A-42. Number of companies performing industrial energy R&D and total number of R&D-performing companies, by industry and size of company: 1997	131
A-43. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by industry and size of company: 1987–97 and projected 1998	134
A-44. Company and other (except Federal) funds for industrial pollution-abatement R&D performance, by selected industry: 1987–97 and projected 1998	138
A-45. Federal funds for industrial pollution-abatement R&D performance, by selected industry: 1987–97 and projected 1998	139

<i>Table</i>	<i>Page</i>
A-46. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by type of pollution: 1987–97 and projected 1998	140
A-47. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by type of pollution and source of funds: 1996–97 and projected 1998	141

GEOGRAPHIC DISTRIBUTION AND DISTRIBUTION BY TYPE OF R&D COST

A-48. Total (company, Federal, and other) funds for industrial R&D performance in selected years, by state: 1977–97	142
A-49. Total (company, Federal, and other) funds for industrial R&D performance, by state and source of funds: 1997	145
A-50. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company, for the U.S. and top 10 R&D-performing states: 1997	147
A-51. Total (company, Federal, and other) funds for industrial R&D performance, by industry, size of company, and type of cost: 1997	151

R&D EMPLOYMENT

A-52. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1987–98	153
A-53. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry, size of company, and source of R&D funds: January 1998	156
A-54. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1987–97	158
A-55. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1997	162
A-56. R&D funds per R&D scientist or engineer in R&D-performing companies ranked by size of R&D program: 1987–97	165
A-57. Domestic employment of R&D-performing companies, by industry and size of company: 1996–97	166
A-58. R&D scientists and engineers per 1,000 employees in R&D-performing companies, by industry and size of company: 1987–97	171
A-59. R&D funds per employee in R&D-performing companies, by size of company: 1987–97	174
A-60. Concentration of total employment in R&D-performing companies ranked by size of R&D program: 1987–97	175

TECHNICAL TABLES

<i>Table</i>		<i>Page</i>
B-1.	Number of companies in the target population and selected for the sample, by industry: 1997	181
B-2.	Relative standard error for selected estimates, by industry and size of company: 1997	186
B-3.	Unit response rates—percentage of companies that responded to survey, by industry: 1997	193
B-4.	Imputation rates for selected items, by industry: 1997	199
B-5.	Reported items—percentage of R&D-performing companies that reported data for selected items: 1997	203
B-6.	Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1995	205
B-7.	Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1996	211
B-8.	Funds for performance of basic research, applied research, development, funds not distributed, and percent of funds not distributed, by industry, size of company, and source of funds: 1997	217

Table A-1. Trends in industrial R&D performance, by source of funds, in current and constant dollars: 1953-97

Page 1 of 2

Year	Total R&D		Federal		Company ¹	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]					
1953.....	3,630	17,988	1,430	7,086	2,200	10,902
1954.....	4,070	19,941	1,750	8,574	2,320	11,367
1955.....	4,640	22,372	2,180	10,511	2,460	11,861
1956.....	6,605	30,764	3,328	15,501	3,277	15,263
1957.....	7,731	34,856	4,335	19,545	3,396	15,311
1958.....	8,389	36,940	4,759	20,956	3,630	15,984
1959.....	9,618	41,908	5,635	24,553	3,983	17,355
1960.....	10,509	45,161	6,081	26,132	4,428	19,029
1961.....	10,908	46,338	6,240	26,508	4,668	19,830
1962.....	11,464	48,087	6,434	26,988	5,029	21,095
1963.....	12,630	52,363	7,270	30,141	5,360	22,222
1964.....	13,512	55,196	7,720	31,536	5,792	23,660
1965.....	14,185	56,831	7,740	31,010	6,445	25,821
1966.....	15,548	60,569	8,332	32,458	7,216	28,111
1967.....	16,385	61,854	8,365	31,578	8,020	30,276
1968.....	17,429	63,057	8,560	30,970	8,869	32,088
1969.....	18,308	63,262	8,451	29,202	9,857	34,060
1970.....	18,067	59,275	7,779	25,522	10,288	33,753
1971.....	18,320	57,143	7,666	23,911	10,654	33,231
1972.....	19,552	58,504	8,017	23,989	11,535	34,515
1973.....	21,249	60,195	8,145	23,074	13,104	37,122
1974.....	22,887	59,493	8,220	21,367	14,667	38,126
1975.....	24,187	57,465	8,605	20,444	15,582	37,021
1976.....	26,997	60,599	9,561	21,461	17,436	39,138
1977.....	29,825	62,882	10,485	22,106	19,340	40,776
1978.....	33,304	65,443	11,189	21,987	22,115	43,456
1979.....	38,226	69,212	12,518	22,665	25,708	46,547
1980.....	44,505	73,769	14,029	23,254	30,476	50,515
1981.....	51,810	78,488	16,382	24,817	35,428	53,671
1982.....	58,650	83,583	18,545	26,429	40,105	57,154
1983.....	65,268	89,213	20,680	28,267	44,588	60,946
1984.....	74,800	98,525	23,396	30,817	51,404	67,708
1985.....	84,239	107,270	27,196	34,631	57,043	72,638
1986.....	87,823	108,989	27,891	34,613	59,932	74,376
1987.....	92,155	110,950	30,752	37,024	61,403	73,926
1988.....	97,015	112,690	30,343	35,246	66,672	77,445
1989.....	102,055	113,748	28,554	31,826	73,501	81,923

See explanatory information and SOURCE at end of table.

Table A-1. Trends in industrial R&D performance, by source of funds, in current and constant dollars: 1953-97

Page 2 of 2

Year	Total R&D		Federal		Company ¹	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]					
1990.....	109,727	117,230	28,125	30,048	81,602	87,182
1991.....	116,952	120,173	26,372	27,098	90,580	93,074
1992.....	119,110	119,110	24,722	24,722	94,388	94,388
1993.....	117,400	114,380	22,809	22,222	94,591	92,158
1994	119,595	113,802	22,463	21,375	97,131	92,426
1995	132,103	122,875	23,451	21,813	108,652	101,062
1996	144,667	132,080	23,653	21,595	121,015	110,486
1997	157,539	141,202	23,928	21,447	133,611	119,755

¹ Company-funded R&D includes funds for industrial R&D performed within company facilities from all sources except the Federal Government. The funds predominately are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Company-financed R&D not performed within the company is excluded.

NOTES: Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (1992) dollars.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-2. Summary data for R&D-performing companies, by detailed industry and size of company: 1996-97

Page 1 of 4

Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January ³	March		
		1996	1997	1996	1997	1996	1997	1996	1997	1997	1998	1996	1997
		[Dollars in millions]										[In thousands]	
All Industries.....		144,667	157,539	23,653	23,928	121,015	133,611	4,076,076	4,573,376	885.7	951.5	18,102	20,221
Distribution by industry:													
Manufacturing ¹		111,864	121,025	20,020	19,823	91,845	101,202	2,765,725	3,084,508	(D)	682	11,347	11,700
Food and kindred products.....	20	(D)	1,808	1	0	(D)	1,808	330,963	366,014	(D)	12	1,033	1,236
Tobacco products.....	21	(D)	(D)	0	0	(D)	(D)	19,630	(D)	(D)	(D)	57	12
Textile mill products.....	22	(D)	(D)	(D)	(D)	303	265	38,592	33,660	2.6	2.4	332	261
Apparel.....	23	(D)	(D)	(D)	(D)	113	242	12,946	19,187	1.2	1.7	102	140
Lumber and wood products, except furniture.....	24	(D)	60	(D)	0	55	60	15,502	11,955	0.6	(D)	94	78
Furniture and fixtures.....	25	(D)	314	(D)	0	598	314	31,734	29,100	3.0 (S)	3.2	245	177
Paper and allied products.....	26	(D)	(D)	(D)	(D)	1,558	1,491	134,607	135,350	11.5 (S)	11.1 (S)	568	554
Printing, publishing, and allied industries.....	27	(D)	367	(D)	0	325	367	35,739	48,225	3.4 (S)	2.4	303	321
Chemicals and allied products.....	28	(D)	(D)	(D)	(D)	17,698	18,693	335,642	353,639	91.8	91.2	1,069	1,043
Petroleum refining and extraction.....	13,29	1,662	(D)	24	(D)	1,638	1,651	249,436	282,965	9.1	8.0	288	242
Rubber products.....	30	(D)	(D)	(D)	(D)	1,334	1,406	74,124	100,785	11.5	12.0	472	482
Leather and leather products...	31	(D)	42	(D)	(D)	41	(D)	13,463	(D)	0.3	0.2	48	52
Stone, clay, and glass products.....	32	517	619	5	2	512	617	38,899	33,440	4.4	4.0 (S)	197	169
Primary metals.....	33	(D)	988	(D)	221	637	767	103,908	133,940	5.5 (S)	6.4 (S)	406	494
Fabricated metal products.....	34	(D)	1,818	(D)	129	1,460	1,689	98,175	110,588	11.0	13.2	617	686
Machinery.....	35	13,685	19,250	117	230	13,568	19,020	264,217	333,668	92.0	116.6	1,355	1,423
Electrical equipment.....	36	22,826	24,972	2,176	1,839	20,650	23,134	338,164	403,147	140.8	176.6	1,430	1,630
Transportation.....	37	32,810	31,997	12,203	12,251	20,607	19,746	501,357	517,156	162.8 (S)	144.2 (S)	1,957	1,837
Professional and scientific instruments.....	38	13,091	13,835	4,393 (S)	4,520	8,698	9,315	111,499	119,289	72.9 (S)	71.6 (S)	641	705
Miscellaneous manufacturing industries ²	39	490	545	3	0	488	545	17,128	31,066	5.0	4.6	133	157

See explanatory information and SOURCE at end of table.

Table A-2. Summary data for R&D-performing companies, by detailed industry and size of company: 1996-97

Page 2 of 4

Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January ³	March	1997	1998
		1996	1997	1996	1997	1996	1997	1996	1997	1997	1998	1996	1997
		[Dollars in millions]											
Distribution by industry:													
Nonmanufacturing ¹		32,803	36,514	3,633	4,105	29,170	32,409	1,310,352	1,488,869	245.8	269.5	6,755	8,521
Agricultural services.....	07-09	44	7	0	0	44	7	1,068	1,522	0.4	0.1	12	18
Mining.....	10-14	77	(D)	8	(D)	68	97	17,693	28,958	0.6	0.7	64	78
Construction.....	15-17	283	261	0	1	283	260	13,864	14,511	3.3	2.6	96	102
Railroad transportation.....	40	34	(D)	0	(D)	34	5	24,968	25,465	(D)	0	143	132
Local and suburban transit and interurban highway passenger transportation.....	41	0	0	0	0	0	0	0	0	(D)	0	0	0
Motor freight transportation and warehousing.....	42	39	600	0	0	39	600	26,267	154,511	(D)	5	(D)	2,073
Water transportation.....	44	0	(D)	0	0	0	(D)	0	(D)	(D)	(D)	0	(D)
Transportation by air.....	45	32	(D)	12	(D)	20	55	(D)	11,579	0.1 (S)	0.2	(D)	136
Pipelines, except natural gas.....	46	0	0	0	0	0	0	0	0	0.0	0.0	0	0
Transportation services.....	47	118	9	0	0	118	9	(D)	(D)	(D)	(D)	7	4 (S)
Communications.....	48	4,103	(D)	133	(D)	3,970	1,884	211,857	278,724	24.7	8.4 (S)	826	1,109
Electric, gas, and sanitary services.....	49	352	(D)	42	(D)	311	258	182,121	188,859	4.0 (S)	1.1	593	525
Durable goods.....	50	4,961	(D)	37	(D)	4,925	6,006	104,604	118,830	34.3	36.0	384	386
Nondurable goods.....	51	901	(D)	0	(D)	901	1,712	68,525	95,125	6.6	8.6	171	232
Building materials, hardware, garden supply and mobile home dealers.....	52	4	5	0	0	4	5	(D)	(D)	(D)	0	(D)	(D)
General merchandise stores....	53	0	0	0	0	0	0	0	0	0.0	0.0	0	0
Food stores.....	54	24	66	0	0	24	66	(D)	30,944	(D)	1	(D)	203
Automotive dealers and gasoline service stations....	55	0	0	0	0	0	0	0	0	(D)	0	0	0
Apparel and accessory stores.....	56	10	(D)	0	0	10	(D)	(D)	(D)	(D)	0	(D)	(D)
Home furniture, furnishings and equipment stores.....	57	78	94	0	0	78	94	(D)	(D)	0.8 (S)	0.9	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-2. Summary data for R&D-performing companies, by detailed industry and size of company: 1996-97

Page 3 of 4

Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January ³	March		
		1996	1997	1996	1997	1996	1997	1996	1997	1997	1998	1996	1997
		[Dollars in millions]											
Distribution by industry:													
Eating and drinking places.....	58	141	139	0	0	141	139	61,807	58,016	0.4 (S)	0.9	683	651
Miscellaneous retail.....	59	386	83	0	0	386	83	2,553	9,806	1.8	0.9	20	82
Depository institutions.....	60	378	450	0	0	378	450	71,801	59,163	4.4	4.7	327	257
Nondepository credit institutions.....	61	88	(D)	0	0	88	(D)	6,165	6,914	(D)	(D)	16	17
Security and commodity brokers, dealers and exchanges, and services....	62	321	442	0	0	321	442	(D)	20,713	(D)	3	(D)	61
Insurance carriers, agents, brokers and services.....	63,64	445	210	0	0	445	210	210,014	135,451	7.8	4.0	343	210
Real estate; holding and other investment offices.....	65,67	65	(D)	2	(D)	62	325	(D)	4,438	0.9	5.7 (S)	(D)	39
Hotels and personal services.....	701,72	131	16	0	0	130	16	7,591	11,091	0.5	0.2	78	178
Business services.....	73	10,685	12,321	361	400	10,325	11,921	104,899	109,755	89.0	113.0	1,432	1,342
Automotive and miscellaneous repair, services and parking.....	75,76	47	258	0	6	47	252	2,541	5,821	0.4	2.5	16	48
Motion pictures.....	78	70	99	0	0	70	99	(D)	(D)	(D)	1	(D)	53
Amusement and recreation services.....	79	42	57	0	0	42	57	929	903	(D)	1	(D)	5
Health services.....	80	845	(D)	4	(D)	841	829	13,398	13,454	7.9	6.8	96	113
Legal services.....	81	2	0	0	0	2	0	(D)	0	(D)	0	(D)	0
Social services.....	83	5	(D)	0	0	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-2. Summary data for R&D-performing companies, by detailed industry and size of company: 1996-97

Page 4 of 4

Industry and size of company	SIC code	Research and development funds						Domestic net sales		R&D scientists and engineers		Domestic employment	
		Total		Federal		Company				January ³	March	1996	1997
		1996	1997	1996	1997	1996	1997	1997	1998	1996	1997	1996	1997
		[Dollars in millions]										[In thousands]	
Distribution by industry:													
Museums, art galleries, and botanical and zoological gardens.....	84	0	0	0	0	0	0	0	0	0.0	0.0	0	0
Engineering and management services.....	87	8,064	9,879	3,027	3,453 (S)	5,036	6,426	76,673	56,486	50.7	60.2	520	344
Miscellaneous services ²	89	27	(D)	7	(D)	20	20	492	(D)	0.2 (S)	0.2 (S)	4	2
Distribution by size of company: [Number of employees]													
Total.....		144,667	157,539	23,653	23,928	121,015	133,611	4,076,076	4,573,376	885.7	951.5	18,102	20,221
Fewer than 500.....		20,249	24,063	2,301	2,209	17,948	21,854	339,405	383,693	177.3	201.8	1,831	1,975
500 to 999.....		4,637	4,966	219	376	4,418	4,590	147,701	164,954	37.7	41.3	806	790
1,000 to 4,999.....		18,273	19,590	512	540	17,761	19,049	618,426	730,532	131.6	137.8	2,838	2,860
5,000 to 9,999.....		11,537	14,266	468	612	11,068	13,655	422,915	579,895	82.2	100.6	2,041	2,254
10,000 to 24,999.....		20,164	21,510	1,031	913	19,133	20,597	791,806	839,149	104.9	116.5	2,734	3,188
25,000 or more.....		69,808	73,144	19,122	19,277	50,686	53,866	1,755,822	1,875,152	351.9 (S)	353.5 (S)	7,852	9,154

¹ Data for manufacturing industries are shown separately for each two-digit SIC, with the exception of SICs 13 and 29 which are combined. Until 1996, data were not broken down into this level of detail for most nonmanufacturing industries.

² Beginning in 1996 manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for companies in these groups are included with their respective SIC classification for this table.

³ Data recorded in January represent employment figures for the previous year.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-3. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1987-97

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
All Industries.....		92,155	97,015	102,055	109,727	116,952	119,110	117,400	119,595	132,103	144,667	157,539	
Distribution by industry:													
Manufacturing.....		84,311	86,503	88,024	88,934	88,506	90,177	86,569	90,749	100,067	111,864	121,025	
Food, kindred, and tobacco products.....	20,21	1,206	(D)	(D)	(D)	1,277	1,386	1,345	1,476	1,566	1,564	1,787	
Textiles and apparel.....	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Lumber, wood products, and furniture.....	24,25	137	(D)	192	216	(D)	(D)	(D)	(D)	(D)	(D)	348	
Paper and allied products.....	26	(D)	(D)	879	1,059	(D)							
Chemicals and allied products.....	28	9,635	11,067	12,069	13,291	14,648	15,381	(D)	(D)	17,547	(D)	(D)	
Industrial chemicals.....	281-82,286	3,716	4,172	4,451	5,010	5,390	5,165	(D)	(D)	(D)	(D)	(D)	
Drugs and medicines.....	283	(D)	4,906	(D)	(D)	(D)	7,944	9,146	9,633	10,215	9,773	11,589	
Other chemicals.....	284-85,28-89	(D)	1,989	(D)	(D)	(D)	2,272	(D)	(D)	(D)	2,505	(D)	
Petroleum refining and extraction.....	13,29	1,897	1,997	2,180	2,306	2,498	2,277	2,152	1,950	1,760	1,654	(D)	
Rubber products.....	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Stone, clay, and glass products.....	32	995	(D)	(D)	(D)	(D)	(D)	538	591	448	468	608	
Primary metals.....	33	730	637	686	739	714	522	669	690	593	(D)	988	
Ferrous metals and products.....	331-32,3398-9	(D)	253	(D)	(D)	(D)	(D)	289	(D)	(D)	(D)	(D)	
Nonferrous metals and products.....	333-36	(D)	384	(D)	(D)	(D)	380	(D)	(D)	(D)	(D)	(D)	
Fabricated metal products.....	34	783	881	904	939	974	1,017	1,158	1,111	1,023	(D)	1,798	
Machinery.....	35	(D)	(D)	(D)	14,446	14,775	14,938	8,381	8,110	(D)	13,455	18,499	
Office, computing, and accounting machines.....	357	(D)	(D)	(D)	(D)	(D)	(D)	4,950	4,106	(D)	(D)	12,840	
Other machinery, except electrical.....	351-56,358-59	2,428	2,682	2,729	(D)	(D)	(D)	3,431	4,004	5,041	(D)	5,659	
Electrical equipment.....	36	15,848	14,128	13,318	13,400	13,415	13,360	13,349	15,338	18,751	22,498	24,585	
Radio and TV receiving equipment.....	365	139	149	96	114	(D)							
Communication equipment.....	366	10,184	8,427	7,071	5,928	4,787	(D)	(D)	(D)	(D)	(D)	(D)	
Electronic components.....	367	4,286	4,133	4,025	3,914	(D)	3,567	5,311	6,032	(D)	(D)	(D)	
Other electrical equipment.....	361-64,369	1,239	1,419	2,126	3,444	(D)	(D)	(D)	(D)	(D)	(D)	4,909	
Transportation equipment.....	37	34,246	34,775	33,859	31,361	27,428	27,494	27,258	28,087	32,441	32,737	31,993	
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	(D)	(D)	(D)	11,718	(D)	(D)	(D)	(D)	
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	(D)	(D)	483	(D)	(D)	(D)	(D)	
Aircraft and missiles.....	372,376	24,458	24,168	22,331	20,635	16,629	17,158	15,056	14,260	16,951	16,224	16,296	

See explanatory information and SOURCE at end of table.

Table A-3. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1987-97

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Professional and scientific instruments.....	38	5,222	5,530	5,992	7,055	8,705	9,542	10,119	11,441	11,976	12,149	13,458	
Scientific and mechanical measuring instruments.....	381-82	(D)	1,959	2,366	3,346	(D)	5,156	5,681	6,952	7,146	(D)	8,135	
Optical, surgical, photographic, and other instruments.....	384-87	(D)	3,571	3,626	3,709	(D)	4,386	4,438	4,489	4,831	(D)	5,323	
Other manufacturing industries ¹	27,31,39	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2,798	
Nonmanufacturing ²		7,844	10,513	14,031	20,793	28,446	28,933	30,831	28,846	32,036	32,803	36,514	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	5,435	4,678	3,013	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	59	73	58	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	440	352	(D)	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	(D)	6,389	(D)	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	17,876	19,022	22,400	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	9,293	10,641	11,960	
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	9,059	(D)	11,706	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	234	(D)	254	
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	756	(D)	(D)	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	(D)	715 (S)	(D)	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	49	
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	7,662	7,318	9,290	
Engineering, architectural, and surveying.....	871	NA	NA	NA	NA	NA	NA	NA	NA	2,933	1,660	2,039	
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	(D)	5,484	(D)	
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	(D)	173	(D)	

See explanatory information and SOURCE at end of table.

Table A-3. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Other services.....	701,72,75-79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	165	(D)	(D)	
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	413	(D)	1,618	
Distribution by size of company: [Number of employees]													
Total.....		92,155	97,015	102,055	109,727	116,952	119,110	117,400	119,595	132,103	144,667	157,539	
Fewer than 500.....		7,163	(S)	7,809	(S)	13,172	13,557	14,620	13,966	16,662	20,249	24,063	
500 to 999.....		1,725	1,669	1,825	2,154	8,000	7,958	3,230	3,608	4,693	4,637	4,966	
1,000 to 4,999.....		7,262	7,622	7,881	8,411	10,453	11,886	13,334	14,617	16,960	18,273	19,590	
5,000 to 9,999.....		4,501	5,245	5,756	6,746	8,049	8,258	9,135	8,912	9,532	11,537	14,266	
10,000 to 24,999.....		12,043	11,506	10,450	12,486	15,770	15,744	15,421	15,972	17,071	20,164	21,510	
25,000 or more.....		59,461	63,694	68,335	71,030	61,508	61,707	61,659	62,519	67,185	69,808	73,144	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-4. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Size of company						
		Total	Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
All Industries.....		157,539	24,063	4,966	19,590	14,266	21,510	73,144
Manufacturing.....		121,025	8,248	2,905	14,300	11,670	16,874	67,028
Food, kindred, and tobacco products.....	20,21	1,787	101	65	265	391	262	703
Textiles and apparel.....	22,23	(D)	52	34	106	(D)	82	(D)
Lumber, wood products, and furniture.....	24,25	348	74	22	77	96	79	0
Paper and allied products.....	26	(D)	25	(D)	140	100	339	889 (S)
Chemicals and allied products.....	28	(D)	508	(D)	3,766	3,200	6,250	5,267
Industrial chemicals.....	281-82,286	(D)	89	(D)	1,192	646	2,229	(D)
Drugs and medicines.....	283	11,589	234	54	2,047	2,207	3,737	3,311
Other chemicals.....	284-85,287-89	(D)	185	59	528	347	284	(D)
Petroleum refining and extraction.....	13,29	(D)	6	(D)	80	(D)	729	790
Rubber products.....	30	(D)	165	113	413	120	243 (S)	(D)
Stone, clay, and glass products.....	32	608	16	31	72	103	386	0
Primary metals.....	33	988	47	22	146	233	(D)	(D)
Ferrous metals and products.....	331-32,3398-99	(D)	8	(D)	55	197	335	(D)
Nonferrous metals and products.....	333-36	(D)	39	(D)	91	37	(D)	(D)
Fabricated metal products.....	34	1,798	451	(D)	205	189	455	(D)
Machinery.....	35	18,499	1,775	586	2,609	1,954	4,155	7,421
Office, computing, and accounting machines....	357	12,840	830	(D)	1,375	904	2,952	(D)
Other machinery, except electrical.....	351-56,358-59	5,659	945	(D)	1,234	1,051	1,203	(D)
Electrical equipment.....	36	24,585	1,789	854	3,628	3,114	1,953	13,248
Radio and TV receiving equipment.....	365	(D)	23	(D)	124	0	0	(D)
Communication equipment.....	366	(D)	520	(D)	937	1,418	0	4,848
Electronic components.....	367	(D)	972	(D)	1,913	1,427	1,668	(D)
Other electrical equipment.....	361-64,369	4,909	273	(D)	654	270	285	(D)

See explanatory information and SOURCE at end of table.

Table A-4. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Size of company						
		Total	Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
Transportation equipment.....	37	31,993	64	166	288	846	762	29,868
Motor vehicles and motor vehicles equipment.....	371	(D)	50	111	87	(D)	536	(D)
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	29	(D)	(D)	(D)
Aircraft and missiles.....	372,376	16,296	(D)	(D)	173	599	(D)	15,331
Professional and scientific instruments.....	38	13,458	1,109	686	2,300	989	652	7,722
Scientific and mechanical measuring instruments....	381-82	8,135	785	485	955	375	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	5,323	324	201	1,345	614	(D)	(D)
Other manufacturing industries ¹	27,31,39	2,798	2,066	(D)	206	309	(D)	32
Nonmanufacturing.....		36,514	15,815	2,061	5,289	2,596	4,636	6,116
Transportation and utilities.....	40-42,44-49	3,013	56	22	138	70	128	2,598
Communications.....	48	(D)	17	(D)	20	(D)	0	(D)
Telephone communications.....	481	(D)	0	(D)	0	(D)	0	1,963
Other communications.....	482-484,489	58	17	(D)	20	0	0	(D)
Electric, gas, and sanitary services.....	49	(D)	15	(D)	97	36	(D)	(D)
Other transportation and utilities.....	40-42,44-47	(D)	24	(D)	22 (S)	(D)	(D)	625
Trade.....	50-59	(D)	3,030	(D)	1,576	789	(D)	1,316
Finance, insurance, and real estate.....	60-65,67	(D)	340	(D)	253	332	(D)	266
Services.....	701,72,73,75-81, 83,84,87,89	22,400	11,074	(D)	3,252	1,344	3,205	(D)
Business services.....	73	11,960	4,235	(D)	2,900	1,286	(D)	358 (S)
Computer and data processing services.....	737	11,706	4,206	775	2,832	1,276	(D)	(D)
Other business services.....	731-736,738	254	29	(D)	67	10	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-4. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Size of company						
		Total	Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
		[Dollars in millions]						
Health services.....	80	(D)	77	(D)	43	0	(D)	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	64	(D)	8 (S)	0	(D)	0
Other health services.....	802-805,808-809	49	13	0	36	0	0	0
Engineering and management services....	87	9,290	6,465	887	265 (S)	(D)	(D)	(D)
Engineering, architectural, and surveying.....	871	2,039	1,390	203	241 (S)	(D)	(D)	0
Research, development, and testing.....	873	(D)	4,820	644	(D)	0	0	(D)
Other engineering and management services.....	872,874	(D)	254	41	(D)	(D)	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	(D)	297	49	45	(D)	(D)	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	1,618	1,315	10	71	62	(D)	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-5. Total (company, Federal, and other) funds for industrial R&D performance, by industry, size of company, and size of R&D program: 1997

Page 1 of 3

Industry and size of company	SIC code	Total	Size of R&D program				
			Less than \$200,000	\$200,000 to \$999,999	\$ 1 million to \$9.9 million	\$ 10 million to \$99.9 million	\$100 million or more
			[Dollars in millions]				
All Industries.....		157,539	1,131	4,427	15,629	29,613	106,738
Distribution by industry:							
Manufacturing.....		121,025	638	2,190	7,753	16,959	93,485
Food, kindred, and tobacco products.....	20,21	1,787	(D)	103	306	842	(D)
Textiles and apparel.....	22,23	(D)	(D)	28	127	147	(D)
Lumber, wood products, and furniture.....	24,25	348	10	64	75	199	0
Paper and allied products.....	26	(D)	2	5	139	502	(D)
Chemicals and allied products.....	28	(D)	(D)	100	481	2,732	15,854
Industrial chemicals.....	281-82,286	(D)	(D)	4	169	1,181	4,138
Drugs and medicines.....	283	11,589	5	73	45	740	10,726
Other chemicals.....	284-285,287-89	(D)	(D)	23	267	811	991
Petroleum refining and extraction.....	13,29	(D)	(D)	0	53	218	1,349
Rubber products.....	30	(D)	28	105	332	536	(D)
Stone, clay, and glass products.....	32	608	(D)	5	71	273	(D)
Primary metals.....	33	988	(D)	19	161	427	(D)
Ferrous metals and products.....	331-32,3398-99	(D)	(D)	10	78	293	(D)
Nonferrous metals and products.....	333-36	(D)	(D)	9	82	134	(D)
Fabricated metal products.....	34	1,798	(D)	193	554	504	(D)
Machinery.....	35	18,499	38	240	1,617	2,781	13,823
Office, computing, and accounting machines.....	357	12,840	(D)	(D)	403	1,094	11,343
Other machinery, except electrical.....	351-56,358-59	5,659	(D)	(D)	1,214	1,687	2,481
Electrical equipment.....	36	24,585	27	268	1,589	3,931	18,771
Radio and TV receiving equipment.....	365	(D)	0	(D)	30	124	0
Communication equipment.....	366	(D)	8	(D)	293	1,526	6,142
Electronic components.....	367	(D)	14	(D)	772	1,476	9,081
Other electrical equipment.....	361-64,369	4,909	6	55	495	806	3,548

See explanatory information and SOURCE at end of table.

Table A-5. Total (company, Federal, and other) funds for industrial R&D performance, by industry, size of company, and size of R&D program: 1997

Page 2 of 3

Industry and size of company	SIC code	Total	Size of R&D program				
			Less than \$200,000	\$200,000 to \$999,999	\$1 million to \$9.9 million	\$10 million to \$99.9 million	\$100 million or more
			[Dollars in millions]				
Distribution by industry:							
Transportation equipment.....	37	31,993	6	44	223	908	30,812
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	44	144	551	(D)
Other transportation equipment.....	373-75,379	(D)	(D)	0	25	168	(D)
Aircraft and missiles.....	372,376	16,296	0	0	54	189	16,053
Professional and scientific instruments.....	38	13,458	6	112	1,133	2,481	9,725
Scientific and mechanical measuring instruments.....	381-82	8,135	5	88	683	1,348	6,012
Optical, surgical, photographic, and other instruments.....	384-87	5,323	2	25	450	1,133	3,713
Other manufacturing industries ¹	27,31,39	2,798	(D)	904	891	479	(D)
Nonmanufacturing		36,514	493	2,237	7,877	12,653	13,254
Transportation and utilities.....	40-42,44-49	3,013	5	49	652	473	1,835
Communications.....	48	(D)	(D)	12	32	(D)	1,711
Telephone communications.....	481	(D)	0	0	0	276	1,711
Other communications.....	482-484,489	58	(D)	12	32	(D)	0
Electric, gas, and sanitary services.....	49	(D)	(D)	17	135	130	(D)
Other transportation and utilities.....	40-42,44-47	(D)	2	20	486	(D)	(D)
Trade.....	50-59	(D)	(D)	406	835	3,594	3,009
Finance, insurance, and real estate.....	60-65,67	(D)	(D)	27	439	439	(D)
Services.....	701,72,73,75-81,83,84,87,89	22,400	97	726	5,852	8,062	7,662
Business services.....	73	11,960	33	452	3,071	3,494	4,909
Computer and data processing services.....	737	11,706	28	437	2,987	3,344	4,909
Other business services.....	731-736,738	254	5	15	84	150	0

See explanatory information and SOURCE at end of table.

Table A-5. Total (company, Federal, and other) funds for industrial R&D performance, by industry, size of company, and size of R&D program: 1997

Page 3 of 3

Industry and size of company	SIC code	Total	Size of R&D program				
			Less than \$200,000	\$200,000 to \$999,999	\$1 million to \$9.9 million	\$10 million to \$99.9 million	\$100 million or more
			[Dollars in millions]				
Distribution by industry:							
Health services.....	80	(D)	34	12	38	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	34	2	29	(D)	(D)
Other health services.....	802-805,808-809	49	0	10	9 (S)	(D)	0
Engineering and management services.....	87	9,290	(D)	162	2,495	4,412	(D)
Engineering, architectural, and surveying.....	871	2,039	(D)	94	794	971	(D)
Research, development, and testing.....	873	(D)	(D)	62	1,534	3,258	2,029 (S)
Other engineering and management services	872,874	(D)	(D)	7	167	183	0
Other services.....	701,72,75-79,81, 83,84,89	(D)	(D)	99	248	(D)	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	1,618	(D)	1,029	99	86	(D)
Distribution by size of company: [Number of employees]							
Total.....		157,539	1,131	4,427	15,629	29,613	106,738
Fewer than 500.....		24,063	(D)	4,131	10,841	7,878	(D)
500 to 999.....		4,966	23	176	1,553	2,722	493
1,000 to 4,999.....		19,590	12	102	2,142	10,075	7,259
5,000 to 9,999.....		14,266	0	12	327	4,533	9,395
10,000 to 24,999.....		21,510	0	3	222	2,871	18,414
25,000 or more.....		73,144	(D)	5	545	1,533	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-6. Number of R&D-performing companies, by industry, size of company, and size of R&D program: 1997

Page 1 of 3

Industry and size of company	SIC code	Total	Size of R&D program				
			Less than \$200,000	\$200,000 to \$999,999	\$ 1 million to \$9.9 million	\$ 10 million to \$99.9 million	\$100 million or more
			[Number of companies]				
All Industries.....		35,112	19,195	9,530	5,065	1,131	190
Distribution by industry:							
Manufacturing.....		18,130	10,005	4,630	2,736	609	149
Food, kindred, and tobacco product	20,21	696	397	167	104	26	2
Textiles and apparel.....	22,23	278	148	76	45	8	1
Lumber, wood products, and furniture.....	24,25	257	129	96	24	8	0
Paper and allied products.....	26	121	53	9	41	17	2
Chemicals and allied products.....	28	602	148	160	174	86	35
Industrial chemicals.....	281-82,286	161	50	5	59	35	12
Drugs and medicines.....	283	199	50	100	6	23	20
Other chemicals.....	284-85,287-89	242	48	55	108	28	3
Petroleum refining and extraction.....	13,29	26	0	0	13	7	6
Rubber products.....	30	639	313	203	100	21	2
Stone, clay, and glass products.....	32	98	50	12	24	9	2
Primary metals.....	33	250	150	30	47	22	2
Ferrous metals and products.....	331-32,3398-99	54	0	19	20	15	1
Nonferrous metals and products.....	333-36	196	150	11	27	7	1
Fabricated metal products.....	34	903	254	423	209	15	2
Machinery.....	35	1,536	473	477	444	118	25
Office, computing, and accounting machines.....	357	119	0	1	50	53	15
Other machinery, except electrical.....	351-56,358-59	1,417	473	476	394	65	10
Electrical equipment.....	36	1,547	324	501	546	143	34
Radio and TV receiving equipment.....	365	19	0	4	12	3	0
Communication equipment.....	366	322	50	129	83	50	10
Electronic components.....	367	748	129	249	297	56	17
Other electrical equipment.....	361-64,369	460	145	120	154	34	7

See explanatory information and SOURCE at end of table.

Table A-6. Number of R&D-performing companies, by industry, size of company, and size of R&D program: 1997

Page 2 of 3

Industry and size of company	SIC code	Total	Size of R&D program				
			Less than \$200,000	\$200,000 to \$999,999	\$ 1 million to \$9.9 million	\$ 10 million to \$99.9 million	\$100 million or more
			[Number of companies]				
Distribution by industry:							
Transportation equipment.....	37	411	200	100	66	27	18
Motor vehicles and motor vehicles equipment	371	377	200	100	55	17	5
Other transportation equipment.....	373-75,379	10	0	0	4	4	2
Aircraft and missiles.....	372,376	24	0	0	7	6	11
Professional and scientific instruments.....	38	760	96	206	357	85	17
Scientific and mechanical measuring instruments	381-82	515	77	153	226	51	8
Optical, surgical, photographic, and other instruments.....	384-87	246	19	53	131	34	9
Other manufacturing industries ¹	27,31,39	10,005	7,273	2,171	543	18	1
Nonmanufacturing		16,982	9,190	4,900	2,329	522	41
Transportation and utilities.....	40-42,44-49	417	180	117	102	14	4
Communications.....	48	90	52	21	7	7	3
Telephone communications.....	481	59	50	0	0	6	3
Other communications.....	482-484,489	31	2	21	7	1	0
Electric, gas, and sanitary services.....	49	161	77	44	35	5	0
Other transportation and utilities.....	40-42,44-47	166	51	52	60	2	1
Trade.....	50-59	3,713	2,286	924	345	148	9
Finance, insurance, and real estate.....	60-65,67	382	199	58	101	20	4
Services.....	701,72,73,75-81, 83,84,87,89	4,891	1,411	1,379	1,745	334	23
Business services.....	73	2,455	484	838	978	138	16
Computer and data processing services.....	737	2,273	367	803	956	132	16
Other business services.....	731-736,738	181	118	35	23	6	0

See explanatory information and SOURCE at end of table.

Table A-6. Number of R&D-performing companies, by industry, size of company, and size of R&D program: 1997

Page 3 of 3

Industry and size of company	SIC code	Total	Size of R&D program				
			Less than \$200,000	\$200,000 to \$999,999	\$ 1 million to \$9.9 million	\$ 10 million to \$99.9 million	\$100 million or more
			[Number of companies]				
Distribution by industry:							
Health services.....	80	483	410	56	13	3	1
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	427	410	6	9	1	1
Other health services.....	802-805,808-809	56	0	50	4	2	0
Engineering and management services.....	87	1,569	351	331	691	190	6
Engineering, architectural, and surveying.....	871	697	201	195	262	38	1
Research, development, and testing.....	873	727	63	119	397	144	5
Other engineering and management services.. ..	872,874	145	87	18	32	8	0
Other services.....	701,72,75-79,81, 83,84,89	385	166	154	62	3	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	7,579	5,114	2,422	36	6	1
Distribution by size of company:							
[Number of employees]							
Total.....		35,112	19,195	9,530	5,065	1,131	190
Fewer than 500.....		31,995	18,732	8,996	3,838	427	1
500 to 999.....		1,127	213	320	468	124	3
1,000 to 4,999.....		1,302	184	185	566	324	43
5,000 to 9,999.....		322	50	20	71	142	39
10,000 to 24,999.....		199	15	3	56	77	49
25,000 or more.....		167	1	6	67	38	55

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-7. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1987-97

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
All Industries.....		61,403	66,672	73,501	81,602	90,580	94,388	94,591	97,131	108,652	121,015	133,611	
Distribution by industry:													
Manufacturing.....		56,259	59,415	63,199	65,251	67,639	71,025	69,901	73,375	81,236	91,845	101,202	
Food, kindred, and tobacco products.....	20,21	1,204	1,173	1,244	1,248	1,277	1,386	1,345	1,476	1,566	1,564	1,787	
Textiles and apparel.....	22,23	243	215	(S)	260	236	261	286	316	381	414	476	
Lumber, wood products, and furniture.....	24,25	137	165	192	216	200	234	196	201	229	634	348	
Paper and allied products.....	26	604	752	879	1,059	1,174	1,182	1,191	1,263	1,404	1,534	1,456	
Chemicals and allied products.....	28	9,445	10,828	11,943	13,168	14,439	15,091	16,658	16,559	17,337	17,520	18,628	
Industrial chemicals.....	281-82,286	3,531	3,939	4,340	4,902	5,225	4,911	5,165	4,780	5,139	5,246	4,970	
Drugs and medicines.....	283	4,095	4,900	5,512	5,917	6,947	7,934	9,132	9,625	10,202	9,769	11,586	
Other chemicals.....	284-85,287-89	1,819	1,989	2,091	2,349	2,267	2,246	2,361	2,154	1,996	2,505	2,072	
Petroleum refining and extraction.....	13,29	1,883	1,975	2,162	2,289	2,487	2,268	2,138	1,939	1,754	1,630	1,612	
Rubber products.....	30	596	718	867	1,056	(D)	1,256	1,059	1,432	1,210	1,269	1,372	
Stone, clay, and glass products.....	32	985	697	615	538	455	479	529	553	441	463	606	
Primary metals.....	33	711	620	666	717	706	514	646	672	580	637	767	
Ferrous metals and products.....	331-32,3398-99	249	252	244	231	225	221	272	241	217	214	414	
Nonferrous metals and products.....	333-36	462	368	422	486	481	293	374	431	363	422	353	
Fabricated metal products.....	34	633	718	726	736	748	723	936	868	937	1,322	1,669	
Machinery.....	35	10,577	11,929	13,342	13,575	13,720	13,903	8,295	8,011	9,676	13,338	18,393	
Office, computing, and accounting machines.....	357	8,193	9,347	10,725	10,988	10,419	10,614	4,917	4,078	4,699	8,132	12,787	
Other machinery, except electrical.....	351-56,358-59	2,384	2,582	2,618	2,587	3,301	3,289	3,378	3,933	4,976	5,206	5,606	
Electrical equipment.....	36	10,449	9,975	9,575	9,267	8,865	9,516	11,682	13,537	17,060	20,356	22,747	
Radio and TV receiving equipment.....	365	139	149	96	114	(D)	93	87	64	114	140	152	
Communication equipment.....	366	5,455	4,798	4,159	3,584	(S)	3,381	3,954	4,939	3,845	4,359	7,377	
Electronic components.....	367	3,630	3,684	3,655	3,496	3,177	3,320	5,105	5,870	9,628	12,497	10,786	
Other electrical equipment.....	361-64,369	1,225	1,345	1,664	2,073	(D)	2,722	2,537	2,664	3,473	3,360	4,432	
Transportation equipment.....	37	13,462	13,910	14,596	14,264	14,858	16,292	16,640	17,695	19,311	20,535	19,742	
Motor vehicles and motor vehicles equipment.....	371	7,167	7,783	8,756	8,594	9,063	9,132	10,659	11,950	13,590	14,528	13,758	
Other transportation equipment.....	373-75,379	356	361	337	283	262	289	297	279	232	298	307	
Aircraft and missiles.....	372,376	5,939	5,766	5,503	5,387	5,533	6,871	5,684	5,466	5,489	5,710	5,677	

See explanatory information and SOURCE at end of table

Table A-7. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1987-97

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Professional and scientific instruments.....	38	4,950	5,339	5,729	6,318	6,840	7,321	7,542	8,058	8,516	8,207	8,958	
Scientific and mechanical measuring instruments...	381-82	1,598	1,863	2,205	2,696	3,017	3,013	3,196	3,687	3,787	3,283	3,719	
Optical, surgical, photographic, and other instruments.....	384-87	3,352	3,476	3,524	3,621	3,823	4,308	4,346	4,371	4,729	4,924	5,240	
Other manufacturing industries ¹	27,31,39	380	401	438	541	(D)	599	758	796	835	2,423	2,642	
Nonmanufacturing ²		5,144	7,257	10,302	16,351	22,941	23,363	24,690	23,756	27,415	29,170	32,409	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	5,183	4,492	2,812	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	4,756	3,970	1,884	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	4,697	3,897	1,826	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	59	73	58	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	347	311	258	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	80	211	670	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	7,514	6,338	7,961	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	710	1,280	1,500	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	13,606	15,904	18,594	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	8,681	10,280	11,560	
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	8,545	10,025	11,318	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	136	255	242	
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	753	735	679	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	737	713	(D)	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	16	23	(D)	
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	4,011	4,572	5,909	
Engineering, architectural, and surveying.....	871	NA	NA	NA	NA	NA	NA	NA	NA	1,050	667	781	
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	2,829	3,776	4,782	
Other engineering and management services....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	132	129	347	

See explanatory information and SOURCE at end of table

Table A-7. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	160	317	446	
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	402	1,156	1,541	
Distribution by size of company: [Number of employees]													
Total.....		61,403	66,672	73,501	81,602	90,580	94,388	94,591	97,131	108,652	121,015	133,611	
Fewer than 500.....		6,200	(S)	(S)	(S)	11,285	11,532	13,006	12,802	14,684	17,948	21,854	
500 to 999.....		1,610	1,748	1,934	2,144	7,819	7,807	3,048	3,426	4,468	4,418	4,590	
1,000 to 4,999.....		6,281	6,820	7,546	8,363	9,403	10,865	12,219	13,533	16,162	17,761	19,049	
5,000 to 9,999.....		3,753	4,075	4,509	4,997	7,233	7,495	8,371	8,087	9,289	11,068	13,655	
10,000 to 24,999.....		9,681	10,512	11,631	12,890	12,397	12,328	12,606	13,625	15,125	19,133	20,597	
25,000 or more.....		33,878	36,785	40,703	45,106	42,443	44,361	45,340	45,658	48,924	50,686	53,866	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: Company-funded R&D includes funds for industrial R&D performed within company facilities from all sources except the Federal Government. The funds predominantly are the company's own, but also include funds from outside organizations such as other companies, research institutions, universities and colleges, nonprofit organizations, and state governments. Company-financed R&D not performed within the company is excluded.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-8. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
All Industries.....		133,611	21,854	4,590	19,049	13,655	20,597	53,866
Manufacturing.....		101,202	7,852	2,794	13,975	11,131	16,164	49,287
Food, kindred, and tobacco products.....	20,21	1,787	101	65	265	391	262	703
Textiles and apparel.....	22,23	476	52	34	106	(D)	82	(D)
Lumber, wood products, and furniture.....	24,25	348	74	22	77	96	79	0
Paper and allied products.....	26	1,456	(D)	(D)	140	100	339	844 (S)
Chemicals and allied products.....	28	18,628	507	189	3,733	3,194	5,934	5,071
Industrial chemicals.....	281-82,286	4,970	(D)	77	1,185	641	1,913	(D)
Drugs and medicines.....	283	11,586	232	54	2,045	2,207	3,737	3,311
Other chemicals.....	284-85,287-89	2,072	(D)	59	502	347	284	(D)
Petroleum refining and extraction.....	13,29	1,612	6	15 (S)	80	0	729	783
Rubber products.....	30	1,372	(D)	113	410	108	243 (S)	(D)
Stone, clay, and glass products.....	32	606	16	31	71	103	386	0
Primary metals.....	33	767	45	21	146	206	(D)	(D)
Ferrous metals and products.....	331-32,3398-99	414	8	2	54	169	(D)	(D)
Nonferrous metals and products.....	333-36	353	37	19	91	37	(D)	(D)
Fabricated metal products.....	34	1,669	367	(D)	192	157	454	(D)
Machinery.....	35	18,393	1,769	585	2,597	1,942	4,142	7,357
Office, computing, and accounting machines.....	357	12,787	830	(D)	1,365	898	2,952	(D)
Other machinery, except electrical.....	351-56,358-59	5,606	939	(D)	1,232	1,044	1,190	(D)
Electrical equipment.....	36	22,747	1,683	823	3,456	3,107	1,938	11,739
Radio and TV receiving equipment.....	365	152	21	(D)	122	0	0	(D)
Communication equipment.....	366	7,377	493	(D)	805	1,414	0	(D)
Electronic components.....	367	10,786	957	(D)	1,891	1,427	1,653	(D)
Other electrical equipment.....	361-64,369	4,432	212	165	638	267	285	2,865

See explanatory information and SOURCE at end of table.

Table A-8. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Transportation equipment.....	37	19,742	55	151	269	409	727	18,132
Motor vehicles and motor vehicles equipment.....	371	13,758	50	111	87	(D)	536	(D)
Other transportation equipment.....	373-75,379	307	(D)	(D)	29	(D)	(D)	(D)
Aircraft and missiles.....	372,376	5,677	(D)	(D)	154	178	(D)	5,211
Professional and scientific instruments.....	38	8,958	1,071	622	2,228	981	509	3,547
Scientific and mechanical measuring instruments.....	381-82	3,719	759	427	892	370	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	5,240	313	194	1,336	611	(D)	(D)
Other manufacturing industries ¹	27,31,39	2,642	1,916	(D)	206	(D)	(D)	(D)
Nonmanufacturing.....		32,409	14,002	1,796	5,074	2,524	4,434	4,579
Transportation and utilities.....	40-42,44-49	2,812	56	22	121	70	107	2,437
Communications.....	48	1,884	17	(D)	20	(D)	0	(D)
Telephone communications.....	481	1,826	0	(D)	0	(D)	0	1,802
Other communications.....	482-484,489	58	17	(D)	20	0	0	(D)
Electric, gas, and sanitary services.....	49	258	15	(D)	92	35	(D)	(D)
Other transportation and utilities.....	40-42,44-47	670	24	(D)	9	(D)	(D)	625
Trade.....	50-59	7,961	3,029	(D)	1,575	789	(D)	1,297
Finance, insurance, and real estate.....	60-65,67	1,500	340	(D)	253	330	(D)	266
Services.....	701,72,73,75-81, 83,84,87,89	18,594	9,335	1,483	3,055	(D)	3,024	(D)
Business services.....	73	11,560	3,922	800	2,874	1,234	(D)	(D)
Computer and data processing services.....	737	11,318	3,900	771	2,807	1,224	(D)	(D)
Other business services.....	731-736,738	242	22	29 (S)	67	10	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-8. Company and other (except Federal) funds for industrial R&D performance, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Health services.....	80	679	72	(D)	43	0	(D)	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	60	(D)	8 (S)	0	(D)	0
Other health services.....	802-805,808-809	(D)	12	(D)	36	0	0	0
Engineering and management services.....	87	5,909	5,063	631	93	(D)	27	(D)
Engineering, architectural, and surveying.....	871	781	632	56	69	(D)	(D)	0
Research, development, and testing.....	873	4,782	4,177	534	(D)	0	0	(D)
Other engineering and management services...	872,874	347	254	41	(D)	(D)	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	446	278	(D)	45	11	(D)	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	1,541	1,241	10	71	(D)	(D)	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-9. Company-financed R&D contracted to outside organizations by R&D-performing companies,
by industry and size of company: 1991, 1993-97**

Page 1 of 3

Industry and size of company	SIC code	1991	1993	1994	1995	1996	1997
		[Dollars in millions]					
All Industries.....		3,319	3,462	3,618	5,177	5,833	6,000
Distribution by industry:							
Manufacturing.....		2,577	2,339	2,450	3,812	4,293	4,143
Food, kindred, and tobacco products.....	20,21	44	43	43	41	50	53
Textiles and apparel.....	22,23	(D)	2	4	1	3	9
Lumber, wood products, and furniture.....	24,25	(D)	8	8	7	(D)	(D)
Paper and allied products.....	26	12	5	4	14	4	4 (S)
Chemicals and allied products.....	28	1,087	1,117	1,239	2,386	2,537	2,505
Industrial chemicals.....	281-82,286	95	43	38	259	229	(D)
Drugs and medicines.....	283	771	942	1,055	1,751	2,098	2,259
Other chemicals.....	284-85,287-89	221	132	146	376	210	(D)
Petroleum refining and extraction.....	13,29	35	56	52	32	24	(D)
Rubber products.....	30	18	65	22	32	36	32
Stone, clay, and glass products.....	32	(D)	2	6	2	9	(D)
Primary metals.....	33	24	12	15	13	16	9
Ferrous metals and products.....	331-32,3398-99	4	8	10	5	4	4
Nonferrous metals and products.....	333-36	20	4	5	8	11	5
Fabricated metal products.....	34	3	21	21	10	28	10
Machinery.....	35	256	125	200	201	330	363
Office, computing, and accounting machines.....	357	229	52	113	84	220	192
Other machinery, except electrical.....	351-56,358-59	27	73	87	117	110	171
Electrical equipment.....	36	114	143	116	194	178	186
Radio and TV receiving equipment.....	365	0	(D)	1	2	(D)	(D)
Communication equipment.....	366	63	20	38	40	(D)	67
Electronic components.....	367	38	24	24	75	88	44
Other electrical equipment.....	361-64,369	13	(D)	54	77	54	(D)
Transportation equipment.....	37	687	(D)	591	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment.....	373-75,379	(S)	(D)	(D)	5	(D)	(D)
Aircraft and missiles.....	372,376	(D)	52	83	72	(D)	(D)
Professional and scientific instruments.....	38	(D)	189	57	114	55	83
Scientific and mechanical measuring instruments.....	381-82	4	25	16	45	8	24
Optical, surgical, photographic, and other instruments.....	384-87	(D)	163	40	68	47	60
Other manufacturing industries ¹	27,31,39	2	(D)	72	(D)	26	122
Nonmanufacturing ²		742	1,123	1,168	1,365	1,540	1,857

See explanatory information and SOURCE at end of table.

**Table A-9. Company-financed R&D contracted to outside organizations by R&D-performing companies,
by industry and size of company: 1991, 1993-97**

Page 2 of 3

Industry and size of company	SIC code	1991	1993	1994	1995	1996	1997
		[Dollars in millions]					
Distribution by industry:							
Transportation and utilities.....	40-42,44-49	NA	NA	NA	509	466	405
Communications.....	48	NA	NA	NA	264	230	(D)
Telephone communications.....	481	NA	NA	NA	(D)	(D)	(D)
Other communications.....	482-484,489	NA	NA	NA	(D)	(D)	0
Electric, gas, and sanitary services.....	49	NA	NA	NA	219	229	207
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	27	6	(D)
Trade.....	50-59	NA	NA	NA	346	217	353
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	92	153 (S)	184
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	416	694	905
Business services.....	73	NA	NA	NA	151	226	235
Computer and data processing services.....	737	NA	NA	NA	139	224	233
Other business services.....	731-736,738	NA	NA	NA	12	2	2
Health services.....	80	NA	NA	NA	38	66 (S)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	(D)	(D)	(D)
Other health services.....	802-805,808-809	NA	NA	NA	(D)	(D)	(D)
Engineering and management services.....	87	NA	NA	NA	200	396	483
Engineering, architectural, and surveying.....	871	NA	NA	NA	13	22	11
Research, development, and testing.....	873	NA	NA	NA	187	373	472
Other engineering and management services...	872,874	NA	NA	NA	0	0	0
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	27	6	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	NA	NA	NA	1	10	10

See explanatory information and SOURCE at end of table.

**Table A-9. Company-financed R&D contracted to outside organizations by R&D-performing companies,
by industry and size of company: 1991, 1993-97**

Page 3 of 3

Industry and size of company	SIC code	1991	1993	1994	1995	1996	1997
		[Dollars in millions]					
Distribution by size of company: [Number of employees]							
Total.....		3,319	3,462	3,618	5,177	5,833	6,000
Fewer than 500.....		(S)	751	724	674	699	799
500 to 999.....		35	107	126	174	161 (S)	220
1,000 to 4,999.....		275	310	397	632	632	984
5,000 to 9,999.....		218	327	408	393	761	992
10,000 to 24,999.....		881	468	391	786	1,458	1,031
25,000 or more.....		1,762	1,497	1,574	2,518	2,121	1,974

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-10. Number of R&D-performing companies contracting R&D performance to outside organizations
and total number of R&D-performing companies, by industry and size of company: 1997**

Page 1 of 3

Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
All Industries.....		35,112	3,342	31,995	2,729	1,127	151	1,302	227	322	111	199	48	167	75
Manufacturing.....		18,130	1,897	15,898	1,549	886	127	938	141	197	34	138	29	73	17
Food, kindred, and tobacco products.....	20,21	696	134	426	69	112	43	115	14	17	4	15	2	11	2
Textiles and apparel.....	22,23	278	35	181	17	44	15	41	2	3	0	7	1	2	0
Lumber, wood products, and furniture.....	24,25	257	11	162	4	52	2	29	4	10	1	4	0	0	0
Paper and allied products.....	26	121	11	57	0	2	0	41	9	6	1	9	0	6	1
Chemicals and allied products.....	28	602	130	424	88	32	6	95	17	27	9	17	6	6	4
Industrial chemicals.....	281-82,286	161	29	91	20	8	0	42	5	11	1	7	2	2	1
Drugs and medicines.....	283	199	73	159	55	3	1	22	8	7	4	5	3	3	2
Other chemicals.....	284-85,287-89	242	28	174	13	21	5	32	4	9	4	5	1	1	1
Petroleum refining and extraction.....	13,29	26	4	2	0	3	0	11	1	0	0	7	3	3	0
Rubber products.....	30	639	32	459	14	93	9	73	6	7	1	5	2	2	1
Stone, clay, and glass products.....	32	98	8	65	0	10	2	13	5	5	0	5	1	0	0
Primary metals.....	33	250	18	126	4	63	2	31	6	17	3	10	2	3	1
Ferrous metals and products.....	331-32,3398-99	54	11	11	3	4	0	17	3	14	3	8	1	1	1
Nonferrous metals and products.....	333-36	196	7	116	1	59	2	14	3	3	0	2	1	2	0
Fabricated metal products.....	34	903	65	731	45	74	5	74	10	10	1	11	4	2	0
Machinery.....	35	1,536	130	1,233	78	108	15	144	26	28	5	18	4	5	2
Office, computing, and accounting machines.....	357	119	7	77	1	10	0	16	3	8	1	6	1	2	1
Other machinery, except electrical.....	351-56,358-59	1,417	123	1,156	77	98	15	128	23	20	4	12	3	3	1
Electrical equipment.....	36	1,547	284	1,217	239	140	14	136	20	33	7	11	2	11	2
Radio and TV receiving equipment.....	365	19	3	14	2	2	1	3	0	0	0	0	0	0	0
Communication equipment.....	366	322	89	255	81	25	2	23	4	16	1	0	0	3	1
Electronic components.....	367	748	121	625	110	60	1	46	8	10	1	5	1	2	0
Other electrical equipment.....	361-64,369	460	72	323	47	54	10	64	8	7	5	6	1	6	1

See explanatory information and SOURCE at end of table.

**Table A-10. Number of R&D-performing companies contracting R&D performance to outside organizations
and total number of R&D-performing companies, by industry and size of company: 1997**

Page 2 of 3

Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
Transportation equipment.....	37	411	111	302	100	54	0	18	5	14	1	10	1	13	4
Motor vehicles and motor vehicles equipment.....	371	377	105	300	100	51	0	6	1	8	1	8	1	4	2
Other transportation equipment.....	373-75,379	10	1	0	0	2	0	4	1	1	0	1	0	2	0
Aircraft and missiles.....	372,376	24	5	2	0	1	0	8	3	5	0	1	0	7	2
Professional and scientific instruments....	38	760	130	611	104	58	11	74	14	10	1	3	0	5	0
Scientific and mechanical measuring instruments.....	381-82	515	62	440	52	37	6	29	4	4	0	2	0	3	0
Optical, surgical, photographic, and other instruments.....	384-87	246	68	171	52	21	5	45	10	6	1	1	0	2	0
Other manufacturing industries ¹	27,31,39	10,005	796	9,901	789	40	3	44	3	10	0	6	1	4	0
Nonmanufacturing		16,982	1,445	16,097	1,180	241	24	364	86	125	77	61	19	94	58
Transportation and utilities.....	40-42,44-49	417	226	204	52	5	1	65	50	67	63	10	6	66	54
Communications.....	48	90	52	24	0	2	0	4	0	51	50	0	0	9	2
Telephone communications.....	481	59	52	0	0	0	0	0	0	51	50	0	0	8	2
Other communications.....	482-484,489	31	0	24	0	2	0	4	0	0	0	0	0	1	0
Electric, gas, and sanitary services.....	49	161	70	77	2	2	1	57	49	14	11	9	5	2	2
Other transportation and utilities.....	40-42,44-47	166	104	103	50	1	0	4	1	2	2	1	1	55	50
Trade.....	50-59	3,713	378	3,567	353	14	2	73	11	20	7	30	5	10	0
Finance, insurance, and real estate.....	60-65,67	382	221	309	200	31	0	23	13	9	2	3	3	7	3
Services.....	701,72,73,75-81, 83,84,87,89	4,891	563	4,482	525	182	16	179	12	20	4	17	5	11	1
Business services.....	73	2,455	342	2,276	318	84	9	65	10	14	4	5	0	10	1
Computer and data processing services.....	737	2,273	288	2,144	267	63	8	51	10	10	2	3	0	3	1
Other business services.....	731-736,738	181	54	133	51	22	1	14	0	4	2	2	0	7	0

43

See explanatory information and SOURCE at end of table.

**Table A-10. Number of R&D-performing companies contracting R&D performance to outside organizations
and total number of R&D-performing companies, by industry and size of company: 1997**

Page 3 of 3

Industry	SIC code	Total		Size of company											
				Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside	Total	Outside
Health services.....	80	483	6	456	3	3	0	21	2	0	0	3	1	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	427	4	404	2	3	0	17	1	0	0	3	1	0	0
Other health services.....	802-805,808-809	56	2	52	1	0	0	4	1	0	0	0	0	0	0
Engineering and management services.....	87	1,569	210	1,495	203	42	6	23	0	3	0	5	1	1	0
Engineering, architectural, and surveying.....	871	697	42	661	38	14	3	18	0	1	0	3	1	0	0
Research, development, and testing.....	873	727	168	711	165	13	3	2	0	0	0	0	0	1	0
Other engineering and management services.....	872,874	145	0	123	0	15	0	3	0	2	0	2	0	0	0
Other services.....	701,72,75-79,81, 83,84,89	385	6	255	2	53	1	70	0	3	0	4	3	0	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	7,579	57	7,535	50	8	5	24	1	9	1	1	0	1	0

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-11. Company-financed R&D performed outside the United States by U.S. R&D-performing domestic companies and their foreign subsidiaries, by industry and size of company: 1987-97

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
All Industries.....		5,226	6,208	6,706	7,952	9,147	10,063	9,565	9,395	13,052	14,050	13,107	
Distribution by industry:													
Manufacturing.....		5,162	6,062	6,450	7,537	8,369	9,228	7,795	7,895	10,846	11,540	11,743	
Food, kindred, and tobacco products.....	20,21	37	27	42	41	66	88	112	117	142	155	148	
Textiles and apparel.....	22,23	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	
Lumber, wood products, and furniture.....	24,25	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	
Paper and allied products.....	26	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	34	
Chemicals and allied products.....	28	1,243	1,548	1,532	2,007	2,401	2,676	2,833	2,456	4,194	3,801	3,867	
Industrial chemicals ¹	281-82,286	625	855	609	720	1,009	1,045	1,318	917	1,632	1,720	863	
Drugs and medicines.....	283	618	693	923	1,287	1,392	1,631	1,516	1,539	2,562	2,082	2,413	
Other chemicals.....	284-85,287-89	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	591	
Petroleum refining and extraction.....	13,29	47	59	47	76	107	119	104	111	76	78	91	
Rubber products.....	30	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	197	
Stone, clay, and glass products.....	32	(D)	(D)	(D)	59	38	41	38	27	31	32	17	
Primary metals.....	33	18	23	24	26	20	18	12	15	26	29	20	
Ferrous metals and products.....	331-32,3398-99	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	
Nonferrous metals and products.....	333-36	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)	
Fabricated metal products.....	34	40	(D)	(D)	95	86	109	119	125	111	133	132	
Machinery.....	35	1,233	1,326	1,432	1,451	1,476	1,439	340	308	501	1,404	1,819	
Office, computing, and accounting machines.....	357	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,196	
Other machinery, except electrical.....	351-56,358-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	623	
Electrical equipment.....	36	432	591	573	770	651	568	525	495	872	959	981	
Radio and TV receiving equipment.....	365	0	(D)	(D)	(D)	2	(D)	(D)	3	(D)	(D)	0	
Communication equipment.....	366	188	290	199	174	151	(D)	(D)	110	(D)	(D)	399	
Electronic components.....	367	204	246	160	185	164	168	322	276	437	470	362	
Other electrical equipment.....	361-64,369	39	(D)	(D)	(D)	334	217	113	107	291	260	220	
Transportation equipment.....	37	(D)	1,750	1,916	2,055	2,402	(D)	(D)	(D)	(D)	(D)	(D)	
Motor vehicles and motor vehicles equipment ¹	371	(D)	1,477	1,501	1,901	2,166	(D)	(D)	(D)	(D)	(D)	(D)	
Other transportation equipment.....	373-75,379	TA	TA	TA	TA	TA	TA	TA	TA	TA	TA	19	
Aircraft and missiles.....	372,376	237	273	415	154	236	493	(D)	251	284	(D)	(D)	

See explanatory information and SOURCE at end of table.

Table A-11. Company-financed R&D performed outside the United States by U.S. R&D-performing domestic companies and their foreign subsidiaries, by industry and size of company: 1987-97

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Professional and scientific instruments.....	38	317	404	474	611	656	685	751	900	988	960	1,201	
Scientific and mechanical measuring instruments.. ..	381-82	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	200	
Optical, surgical, photographic, and other instruments.....	384-87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,001	
Other manufacturing industries ²	27,31,39	138	178	269	344	467	524	(D)	572	(D)	(D)	86	
Nonmanufacturing ³		64	146	256	415	778	835	1,770	1,500	2,206	2,510	1,364	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	408
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	914
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	786
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	89
Engineering, architectural, and surveying...	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	10

See explanatory information and SOURCE at end of table.

Table A-11. Company-financed R&D performed outside the United States by U.S. R&D-performing domestic companies and their foreign subsidiaries, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	75
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	3
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	(D)
Other nonmanufacturing industries ²	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	36
Distribution by size of company:													
[Number of employees]													
Total.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	13,107
Fewer than 500.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	324
500 to 999.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	205
1,000 to 4,999.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,057
5,000 to 9,999.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1,352
10,000 to 24,999.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2,632
25,000 or more.....		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	6,537

¹ Until 1997, the values for Industrial chemicals (SIC 281 282, 286) and Other chemicals (SIC 284 285, 287 289) were combined and displayed as Industrial and other chemicals (SIC 281 282, 284 289). Also, the value for Motor vehicles and motor vehicles equipment (SIC 371) and Other transportation equipment (SIC 373 375, 379) were combined and displayed as Motor vehicles and other transportation (SIC 371, 373 375, 379).

² Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

³ Nonmanufacturing industries for 1990 and prior years included the following SICs only: 10 11, 14 17, 40 42, 44 51, 53 54, 56, 60, 62-63, 72 73, 78, 806 07, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NA = Not available.

TA = Total not available separately.

NOTES: Data are reported in current U.S. dollars.

As a result of a new sample design, statistics for 1988 91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-12. Company-financed industrial R&D performed outside the United States by U.S. R&D-performing domestic companies and their foreign subsidiaries, by country: 1997

Location of foreign subsidiary	Number of companies	Total [Dollars in millions]
Total ¹	1,122	13,107
Distribution by country:		
Canada.....	127	432
Germany.....	119	1,772
France.....	108	787
Japan.....	71	700
United Kingdom.....	190	1,025
Puerto Rico.....	16	18
Other countries.....	337	1,900
Undistributed ²	776	6,473
Distribution by companies with R&D expenditures in one or more countries:		
Total.....	1,122	13,107
One country.....	126	235
Two countries.....	23	137
Three countries....	13	44
Four countries.	1	(D)
Five countries.....	1	(D)
More than five countries	0	0
Undistributed ^{2 3}	958	12,676

¹ Detail does not add to total because categories are not mutually exclusive.

² Includes data reported on Form RD-1L that were not allocated to a specific country, and total foreign R&D reported on Form RD-1A. Form RD-1A does not collect data by country.

³ To avoid double counting, if a company reported ANY foreign R&D expenditures that were not allocated to specific countries, all foreign R&D expenditures, including those that may have been allocated to specific countries, are included in this cell. For example, if a company allocated a portion of its foreign R&D expenditures to Canada and left the remainder unallocated, ALL of its foreign R&D is included in this cell because it could not be determined during processing how many other countries were sites of R&D performance.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NOTE: Data are reported in current U.S. dollars.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-13. Federal funds for industrial R&D performance, by industry and size of company: 1987-97

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
All Industries.....		30,752	30,343	28,554	28,125	26,372	24,722	22,809	22,463	23,451	23,653	23,928	
Distribution by industry:													
Manufacturing.....		28,052	27,088	24,826	23,683	20,867	19,152	16,669	17,373	18,831	20,020	19,823	
Food, kindred, and tobacco products.....	20,21	2	(D)	(D)	(D)	0	0	0	0	0	0	0	
Textiles and apparel.....	22,23	(D)	(D)	(D)	(D)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	
Lumber, wood products, and furniture.....	24,25	0	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)	0	
Paper and allied products.....	26	(D)	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Chemicals and allied products.....	28	190	238	126	123	209	(S)	(D)	(D)	210 (S)	(D)	(D)	
Industrial chemicals.....	281-82,286	185	232	111	109	165	(S)	(D)	(D)	(D)	(D)	(D)	
Drugs and medicines.....	283	(D)	6	(D)	(D)	(D)	(S)	15	8	14	3	3 (S)	
Other chemicals.....	284-85,287-89	(D)	0	(D)	(D)	(D)	(S)	(D)	(D)	(D)	0	(D)	
Petroleum refining and extraction.....	13,29	14	22	(S)	(S)	11	9	14	10	6	24	(D)	
Rubber products.....	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Stone, clay, and glass products.....	32	10	(D)	(D)	(D)	(D)	(D)	9	38	6	5	2	
Primary metals.....	33	19	17	22	(D)	8	(S)	23	17	13	(D)	221	
Ferrous metals and products.....	331-32,3398-99	(D)	1	(D)	(D)	1	(D)	17	(D)	(D)	(D)	(D)	
Nonferrous metals and products.....	333-36	(D)	16	(D)	(D)	7	(D)	6	(D)	(D)	(D)	(D)	
Fabricated metal products.....	34	150	163	178	203	226	294	222	243	86	(D)	129	
Machinery.....	35	(D)	(D)	(D)	871	1,055	1,035	86	99	(D)	117	106	
Office, computing, and accounting machines.....	357	(D)	(D)	(D)	(D)	(D)	(D)	33	28	(D)	(D)	53	
Other machinery, except electrical.....	351-56,358-59	44	101	112	(D)	(D)	(D)	53	71	64	(D)	53	
Electrical equipment.....	36	5,399	4,153	3,743	4,133	4,550	3,844	1,667	1,801	1,690	2,143	1,839	
Radio and TV receiving equipment.....	365	0	0	0	0	0	(D)	(D)	(D)	(D)	(D)	(D)	
Communication equipment.....	366	4,729	3,630	2,911	2,344	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Electronic components.....	367	656	449	369	418	(D)	247	206	162	(D)	(D)	(D)	
Other electrical equipment.....	361-64,369	14	74	463	1,371	(D)	(D)	(D)	(D)	(D)	(D)	477	
Transportation equipment.....	37	20,784	20,865	19,262	17,097	12,570	11,202	10,617	10,392	13,130	12,202	12,251	
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Aircraft and missiles.....	372,376	18,519	18,402	16,828	15,248	11,096	(S)	9,372	8,794	11,462	10,515	10,619	

See explanatory information and SOURCE at end of table.

Table A-13. Federal funds for industrial R&D performance, by industry and size of company: 1987-97

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Professional and scientific instruments....	38	272	191	263	737	1,865	2,221	2,577	3,384	3,460 (S)	3,942	4,499	
Scientific and mechanical measuring instruments	381-82	(D)	(S)	(S)	(S)	(D)	2,143	2,484	3,266	3,358 (S)	(D)	4,416	
Optical, surgical, photographic, and other instruments.....	384-87	(D)	95	101	87	(D)	78	92	118	102	(D)	84	
Other manufacturing industries ¹	27,31,39	(D)	(D)	(D)	(D)	(D)	61	(D)	(D)	(D)	(D)	156	
Nonmanufacturing ²		2,700	3,256	3,729	4,442	5,505	5,570	6,140	5,090	4,620	3,633	4,105	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	252	186	200	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	93	42	(D)	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	4,270	3,118	3,805	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	612	361	400	
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	514	(D)	389	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	98	(D)	11	
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	4	(D)	(D)	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	(D)	3	4	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	3,650	2,746	3,381 (S)	
Engineering, architectural, and surveying.....	871	NA	NA	NA	NA	NA	NA	NA	NA	1,883	994	1,258	

See explanatory information and SOURCE at end of table.

Table A-13. Federal funds for industrial R&D performance, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars in millions]											
Distribution by industry:													
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	(D)	1,708 (S)	(D)	
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	(D)	45	(D)	
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	4	(D)	(D)	
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	11	(D)	77	
Distribution by size of company: [Number of employees]													
Total.....		30,752	30,343	28,554	28,125	26,372	24,722	22,809	22,463	23,451	23,653	23,928	
Fewer than 500.....		963	816	901	895	1,887	2,025	1,614	1,164	1,978	2,301	2,209	
500 to 999.....		115	131	117	(S)	181	151	182	182	225	219	376	
1,000 to 4,999.....		981	1,093	958	881	1,050	(S)	1,115	1,083	798	512	540	
5,000 to 9,999.....		748	864	740	257	816	763	764	825	243	468	612	
10,000 to 24,999.....		2,362	1,705	1,129	1,526	3,373	3,416	2,816	2,348	1,946 (S)	1,031 (S)	913	
25,000 or more.....		25,583	25,734	24,709	24,436	19,065	17,346	16,319	16,862	18,261	19,122	19,277	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-14. Federal funds for industrial R&D performance, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
All Industries.....		23,928	2,209	376	540	612	913	19,277
Manufacturing.....		19,823	396	111	325	(D)	710	(D)
Food, kindred, and tobacco products.....	20,21	0	0	0	0	0	0	0
Textiles and apparel.....	22,23	(D)	0	0	0	0	0	(D)
Lumber, wood products, and furniture.....	24,25	0	0	0	0	0	0	0
Paper and allied products.....	26	(D)	0	0	0	0	0	(D)
Chemicals and allied products.....	28	(D)	(D)	0	33	(D)	(D)	(D)
Industrial chemicals.....	281-82,286	(D)	0	0	(D)	(D)	(D)	(D)
Drugs and medicines.....	283	3 (S)	(D)	0	(D)	0	0	0
Other chemicals.....	284-85,287-89	(D)	0	0	(D)	0	0	0
Petroleum refining and extraction.....	13,29	(D)	0	0	0	0	(D)	(D)
Rubber products.....	30	(D)	0	0	(D)	(D)	0	0
Stone, clay, and glass products.....	32	2	0	0	(D)	0	(D)	0
Primary metals.....	33	221	(D)	(D)	(D)	27	(D)	(D)
Ferrous metals and products.....	331-32,3398-99	(D)	0	0	(D)	27	(D)	(D)
Nonferrous metals and products.....	333-36	(D)	(D)	(D)	(D)	0	0	(D)
Fabricated metal products.....	34	129	84	(D)	(D)	(D)	(D)	0
Machinery.....	35	106	6 (S)	(D)	(D)	12	(D)	(D)
Office, computing, and accounting machines.....	357	53	0	0	(D)	(D)	0	(D)
Other machinery, except electrical.....	351-56,358-59	53	6 (S)	(D)	(D)	(D)	(D)	(D)
Electrical equipment.....	36	1,839	106	31 (S)	172	(D)	(D)	1,508
Radio and TV receiving equipment.....	365	(D)	(D)	0	(D)	0	0	0
Communication equipment.....	366	(D)	27	(D)	(D)	(D)	0	(D)
Electronic components.....	367	(D)	(D)	11 (S)	(D)	0	(D)	(D)
Other electrical equipment.....	361-64,369	477	62	(D)	(D)	(D)	0	(D)
Transportation equipment.....	37	12,251	(D)	(D)	(D)	(D)	(D)	11,736
Motor vehicles and motor vehicles equipment.....	371	(D)	0	0	0	(D)	0	(D)

See explanatory information and SOURCE at end of table.

Table A-14. Federal funds for industrial R&D performance, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
Other transportation equipment.....	373-75,379	(D)	0	0	0	0	0	(D)
Aircraft and missiles.....	372,376	10,619	(D)	(D)	(D)	(D)	(D)	10,120
Professional and scientific instruments.....	38	4,499	37	64	73	(D)	(D)	(D)
Scientific and mechanical measuring instruments..	381-82	4,416	26	(D)	63	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	84	11	(D)	10	(D)	0	(D)
Other manufacturing industries ¹	27,31,39	156	(D)	0	0	0	0	(D)
Nonmanufacturing		4,105	1,813	265	215 (S)	(D)	203	(D)
Transportation and utilities.....	40-42,44-49	200	0	(D)	(D)	(D)	(D)	(D)
Communications.....	48	(D)	0	0	0	0	0	(D)
Telephone communications.....	481	(D)	0	0	0	0	0	(D)
Other communications.....	482-484,489	0	0	0	0	0	0	0
Electric, gas, and sanitary services.....	49	(D)	0	(D)	(D)	(D)	(D)	0
Other transportation and utilities.....	40-42,44-47	(D)	0	0	(D)	0	(D)	0
Trade.....	50-59	(D)	1	0	(D)	0	(D)	(D)
Finance, insurance, and real estate.....	60-65,67	(D)	0	0	0	(D)	0	0
Services.....	701,72,73,75-81, 83,84,87,89	3,805	1,738	(D)	(D)	67 (S)	(D)	(D)
Business services.....	73	400	313	(D)	25	(D)	0	(D)
Computer and data processing services...	737	389	(D)	(D)	25	(D)	0	(D)
Other business services.....	731-736,738	11	(D)	(D)	0	0	0	0
Health services.....	80	(D)	5	0	0	0	(D)	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	4	(D)	0	0	0	(D)	0
Other health services.....	802-805,808-809	(D)	(D)	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-14. Federal funds for industrial R&D performance, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
[Dollars in millions]								
Engineering and management services.....	87	3,381 (S)	1,401	256	(D)	(D)	(D)	(D)
Engineering, architectural, and surveying.....	871	1,258	758	147	(D)	0	(D)	0
Research, development, and testing.....	873	(D)	(D)	109	0	0	0	(D)
Other engineering and management services....	872,874	(D)	(D)	0	0	(D)	0	0
Other services.....	701,72,75-79,81, 83,84,89	(D)	(D)	0	0	0	0	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	77	74	0	0	(D)	0	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-15. Federal funds for industrial R&D performance, by selected agency and selected industry in selected years: 1977-97

Page 1 of 2

Industry	SIC code	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	
		[Dollars in millions]											
All agencies.....	10,485	12,518	16,382	20,680	27,196	30,752	28,554	26,372	22,809	23,451	23,928	
Chemicals and allied products.....	28	295	346	421	393	230	190	126	209	(D)	210 (S)	(D)	
Machinery.....	35	477	335	694	1,116	1,495	(D)	(D)	1,055	88	(D)	(D)	
Electrical equipment.....	36	2,648	3,309	3,920	4,523	5,161	5,399	3,743	4,550	1,402	1,690	1,839	
Motor vehicles and other transportation equipment.....	371,373-75,379	(T)	(T)	(T)	(T)	(T)	(D)	(D)	(D)	(D)	(D)	1,632	
Aircraft and missiles.....	372,376	5,486	5,840	8,528	11,396	16,582	18,519	16,828	11,096	9,369	11,462	10,619	
Other industries ¹	--	(T)	(T)	(T)	(T)	(T)	(T)	(T)	(D)	9,491	8,333	9,180	
DoD													
Total.....		6,950	7,939	10,540	14,571	20,948	22,252	(S)	(S)	15,044	13,876	12,603	
Chemicals and allied products.....	28	32	36	40	48	(S)	(D)	(S)	(D)	(D)	139	(D)	
Machinery.....	35	395	541	599	963	1,287	(D)	(D)	748	58	47	(D)	
Electrical equipment.....	36	1,692	1,920	2,338	3,057	3,812	(S)	2,229	(S)	(D)	1,442 (S)	1,565	
Motor vehicles and other transportation equipment.....	371,373-75,379	382	(T)	(T)	(T)	(D)	(D)	(D)	(D)	888	1,199	1,166	
Aircraft and missiles.....	372,376	3,900	4,210	6,121	8,888	13,918	13,717	(S)	(S)	6,373	6,631 (S)	4,989 (S)	
Other industries ¹	--	461	(T)	(T)	(T)	(D)	(D)	(D)	(D)	5,707	4,418	4,637	
NASA													
Total.....		1,697	1,786	2,306	2,150	(S)	2,805	(S)	(S)	435	2,054	2,022	
Chemicals and allied products.....	28	(T)	(T)	(T)	(T)	(S)	(D)	0	(S)	2	4	(D)	
Machinery.....	35	54	74	81	(T)	(D)	(D)	(D)	(D)	(D)	2	1 (S)	
Electrical equipment.....	36	208	252	317	188	90	115	(D)	(S)	(D)	(D)	145	
Motor vehicles and other transportation equipment.....	371,373-75,379	(T)	(T)	(T)	(T)	(T)	(D)	(D)	(D)	20	(D)	(D)	
Aircraft and missiles.....	372,376	1,348	1,221	1,785	1,959	(S)	2,650	(S)	(S)	236	985 (S)	1,060 (S)	
Other industries ¹	--	44	119	70	(T)	(D)	(D)	(D)	(D)	137	946	708	

See explanatory information and SOURCE at end of table.

Table A-15. Federal funds for industrial R&D performance, by selected agency and selected industry in selected years: 1977-97

Page 2 of 2

Industry	SIC code	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997	
		[Dollars in millions]											
DOE													
Total.....		2	1,575	1,976	1,949	2,901	2,968	3,221	(S)	2,961	3,547	2,505	
Chemicals and allied products.....	28	2	(T)	(T)	(T)	(S)	171	(S)	(S)	(D)	40	(D)	
Machinery.....	35	2	(T)	(T)	(T)	(S)	(D)	(S)	(D)	(S)	31	38	
Electrical equipment.....	36	2	784	951	917	1,188	1,184	1,353	(S)	57	72	42	
Motor vehicles and other transportation equipment.....	371,373-75,379	2	16	20	(T)	(T)	(D)	(D)	(D)	(D)	0	(D)	
Aircraft and missiles.....	372,376	2	253	340	207	468	688	(S)	(S)	(S)	2,498	1,307	
Other industries ¹	--	2	287	356	(T)	(T)	(D)	(D)	(D)	1,197	906	970	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for all companies in this group are combined with those for companies in "Other industries." As a result, statistics for "Other industries" after 1995 are not comparable with statistics for prior years.

² Data was not tabulated for this agency prior to 1979.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

(T) = Not separately available but included in total.

56

NOTES: Data for DoD, NASA, and DOE do not sum to the totals because the data reported by all other Federal agencies are not tabulated. In addition, Federal R&D data collected with each annual sample (on the RD-1A form) is not allocated by agency type.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-16. Total number of R&D-performing companies and number reporting Federal R&D funds, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Size of company											
		Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
All Industries.....		35,112	2,297	31,995	2,106	1,127	46	1,302	48	322	34	199	24
Manufacturing.....		18,130	683	15,898	544	886	31	938	33	197	25	138	18
Food, kindred, and tobacco products....	20,21	696	0	426	0	112	0	115	0	17	0	15	0
Textiles and apparel.....	22,23	278	1	181	0	44	0	41	0	3	0	7	0
Lumber, wood products, and furniture	24,25	257	0	162	0	52	0	29	0	10	0	4	0
Paper and allied products.....	26	121	2	57	0	2	0	41	0	6	0	9	0
Chemicals and allied products.....	28	602	15	424	2	32	0	95	5	27	3	17	3
Industrial chemicals.....	281-82,286	161	11	91	0	8	0	42	3	11	3	7	3
Drugs and medicines.....	283	199	3	159	2	3	0	22	1	7	0	5	0
Other chemicals.....	284-85,287-89	242	1	174	0	21	0	32	1	9	0	5	0
Petroleum refining and extraction.....	13,29	26	3	2	0	3	0	11	0	0	0	7	2
Rubber products.....	30	639	2	459	0	93	0	73	1	7	1	5	0
Stone, clay, and glass products.....	32	98	3	65	0	10	0	13	2	5	0	5	1
Primary metals.....	33	250	14	126	2	63	1	31	2	17	5	10	2
Ferrous metals and products.....	331-32,3398-99	54	9	11	0	4	0	17	1	14	5	8	2
Nonferrous metals and products.....	333-36	196	5	116	2	59	1	14	1	3	0	2	0
Fabricated metal products.....	34	903	55	731	50	74	1	74	1	10	2	11	1
Machinery.....	35	1,536	18	1,233	5	108	2	144	2	28	4	18	3
Office, computing, and accounting machines.....	357	119	3	77	0	10	0	16	1	8	1	6	0
Other machinery, except electrical.....	351-56,358-59	1,417	15	1,156	5	98	2	128	1	20	3	12	3
Electrical equipment.....	36	1,547	76	1,217	36	140	19	136	9	33	3	11	3
Radio and TV receiving equipment.....	365	19	2	14	1	2	0	3	1	0	0	0	0
Communication equipment.....	366	322	12	255	6	25	2	23	2	16	1	0	0
Electronic components.....	367	748	25	625	2	60	14	46	5	10	0	5	3
Other electrical equipment.....	361-64,369	460	37	323	27	54	3	64	1	7	2	6	0

See explanatory information and SOURCE at end of table.

Table A-16. Total number of R&D-performing companies and number reporting Federal R&D funds, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Size of company													
		Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Transportation equipment.....	37	411	24	302	2	54	1	18	3	14	5	10	1	13	12
Motor vehicles and motor vehicles equipment.....	371	377	5	300	0	51	0	6	0	8	2	8	0	4	3
Other transportation equipment.....	373-75,379	10	2	0	0	2	0	4	0	1	0	1	0	2	2
Aircraft and missiles.....	372,376	24	17	2	2	1	1	8	3	5	3	1	1	7	7
Professional and scientific instruments.....	38	760	75	611	52	58	7	74	8	10	2	3	2	5	4
Scientific and mechanical measuring instruments.....	381-82	515	54	440	38	37	6	29	4	4	1	2	2	3	3
Optical, surgical, photographic, and other instruments.....	384-87	246	21	171	14	21	1	45	4	6	1	1	0	2	1
Other manufacturing industries ¹	27,31,39	10,005	395	9,901	394	40	0	44	0	10	0	6	0	4	1
Nonmanufacturing.....		16,982	1,614	16,097	1,563	241	15	364	15	125	9	61	6	94	6
Transportation and utilities.....	40-42,44-49	417	10	204	0	5	1	65	3	67	2	10	2	66	2
Communications.....	48	90	2	24	0	2	0	4	0	51	0	0	0	9	2
Telephone communications.....	481	59	2	0	0	0	0	0	0	51	0	0	0	8	2
Other communications.....	482-484,489	31	0	24	0	2	0	4	0	0	0	0	0	1	0
Electric, gas, and sanitary services.....	49	161	6	77	0	2	1	57	2	14	2	9	1	2	0
Other transportation and utilities.....	40-42,44-47	166	2	103	0	1	0	4	1	2	0	1	1	55	0
Trade.....	50-59	3,713	5	3,567	2	14	0	73	1	20	0	30	1	10	1
Finance, insurance, and real estate.....	60-65,67	382	1	309	0	31	0	23	0	9	1	3	0	7	0
Services.....	701,72,73,75-81, 83,84,87,89	4,891	822	4,482	788	182	14	179	11	20	4	17	3	11	2
Business services.....	73	2,455	139	2,276	127	84	4	65	4	14	3	5	0	10	1
Computer and data processing services.....	737	2,273	136	2,144	125	63	3	51	4	10	3	3	0	3	1
Other business services.....	731-736,738	181	3	133	2	22	1	14	0	4	0	2	0	7	0

See explanatory information and SOURCE at end of table.

Table A-16. Total number of R&D-performing companies and number reporting Federal R&D funds, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Size of company													
		Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal	Total	Federal
Health services.....	80	483	102	456	101	3	0	21	0	0	0	3	1	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	427	101	404	100	3	0	17	0	0	0	3	1	0	0
Other health services.....	802-805,808-809	56	1	52	1	0	0	4	0	0	0	0	0	0	0
Engineering and management services.....	87	1,569	529	1,495	508	42	10	23	7	3	1	5	2	1	1
Engineering, architectural, and surveying.....	871	697	265	661	251	14	5	18	7	1	0	3	2	0	0
Research, development, and testing.....	873	727	262	711	256	13	5	2	0	0	0	0	0	1	1
Other engineering and management services.....	872,874	145	2	123	1	15	0	3	0	2	1	2	0	0	0
Other services.....	701,72,75-79,81, 83,84,89	385	52	255	52	53	0	70	0	3	0	4	0	0	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	7,579	776	7,535	773	8	0	24	0	9	2	1	0	1	1

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-17. Industry-administered federally-funded R&D centers (FFRDCs) funds by character of work,
full-time-equivalent (FTE) R&D scientists and engineers, and total number of employees: 1987-97**

Item	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
[Dollars in millions]											
Total R&D funds.....	1,995	2,122	2,195	2,323	2,277	2,353	1,965	2,202	2,273	2,297	2,130
Basic research.....	142	337	398	499	461	474	492	503	530	708	625
Applied research.....	623	371	374	386	433	507	435	503	535	231	213
Development.....	1,230	1,414	1,423	1,438	1,383	1,373	1,039	1,196	1,209	1,358	1,292
[Employment]											
Number of FTE R&D scientists and engineers ¹	8,432	10,994	11,618	12,438	11,977	11,770	8,083	8,362	9,033	8,696	8,324
Total employment ²	33,804	36,143	35,716	42,153	39,697	40,755	23,930	23,905	24,031	21,735	20,391

¹ These data were recorded in January of the year following that listed.

² These data were recorded in March of the year listed.

NOTE: Industry-administered federally-funded research and development centers (FFRDCs) conduct R&D almost exclusively for use by the Federal Government. Data for these FFRDCs administered by industry are included in Federal R&D support shown in other tables under the industry classifications of the administering firms. See section C for a listing of industry-administered FFRDCs and their locations.

Table A-18. Total (company, Federal, and other) funds for industrial R&D performance and number of R&D-performing companies in manufacturing and nonmanufacturing industries, by size of company: 1997

Distribution by size of company: [Number of employees]	Total	Manufacturing	Nonmanufacturing
	Funds for industrial R&D		
	[Dollars in millions]		
Total.....	157,539	121,025	36,514
Fewer than 500.....	24,063	8,248	15,815
500 to 999.....	4,966	2,905	2,061
1,000 to 4,999.....	19,590	14,300	5,289
5,000 to 9,999.....	14,266	11,670	2,596
10,000 to 24,999.....	21,510	16,874	4,636
25,000 or more.....	73,144	67,028	6,116
Number of R&D-performing companies			
Total.....	35,112	18,130	16,982
Fewer than 500.....	31,995	15,898	16,097
500 to 999.....	1,127	886	241
1,000 to 4,999.....	1,302	938	364
5,000 to 9,999.....	322	197	125
10,000 to 24,999.....	199	138	61
25,000 or more.....	167	73	94

SOURCE: National Science Foundation/Divison of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-19. Concentration of total, Federal, and company and other industrial R&D funds and net sales of R&D-performing companies, by size of R&D program: 1987-97

Companies ranked by size of R&D program	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Percent of total (company, Federal, and other) R&D funds											
First 4 (1-4).....	19	18	19	18	16	15	17	15	16	15	14
Next 4 (5-8).....	12	12	13	13	8	8	7	8	8	8	8
Next 12 (9-20)....	16	17	16	15	12	13	13	14	13	13	13
Next 20 (21-40)....	12	12	12	12	11	11	12	13	12	12	11
Next 60 (41-100)..	14	15	15	16	15	15	16	15	14	14	14
Next 100 (101-200)	8	8	8	9	12	12	8	9	8	9	9
Next 200 (201-400) ..	6	7	6	7	6	6	7	7	7	7	8
Percent of Federal R&D funds											
First 4 (1-4).....	31	31	36	38	14	11	23	26	35	37	40
Next 4 (5-8).....	18	18	15	16	21	18	17	19	19	20	23
Next 12 (9-20)....	27	27	30	26	21	27	32	32	27	23	18
Next 20 (21-40)....	15	15	11	12	15	13	16	13	8	7	7
Next 60 (41-100)..	7	6	6	6	13	11	5	7	5	5	5
Next 100 (101-200)	1	3	1	1	3	4	5	2	3	4	3
Next 200 (201-400) ..	0	0	0	0	2	2	2	1	3	4	4
Percent of company and other (except Federal) R&D funds											
First 4 (1-4)...	20	21	22	21	17	17	17	16	16	15	13
Next 4 (5-8).....	7	7	7	7	7	8	7	7	7	7	7
Next 12 (9-20)....	12	12	13	12	10	12	12	12	11	11	11
Next 20 (21-40)...	11	12	12	13	10	11	11	11	11	10	11
Next 60 (41-100) ..	16	16	16	17	16	17	14	14	14	14	13
Next 100 (101-200)	10	10	10	10	15	14	9	9	9	10	10
Next 200 (201-400). .	8	8	8	8	7	7	8	8	8	8	9
Percent of net sales ranked by size of total R&D funds											
First 4 (1-4).....	7	7	6	8	7	8	8	8	8	6	6
Next 4 (5-8).....	5	5	5	4	3	3	3	2	2	3	2
Next 12 (9-20)....	5	5	5	5	4	4	4	5	6	6	5
Next 20 (21-40)....	7	6	5	5	4	4	4	5	4	4	5
Next 60 (41-100) ..	11	11	12	12	12	12	11	10	9	8	7
Next 100 (101-200) ..	8	9	8	9	9	9	8	8	8	11	8
Next 200 (201-400)....	12	10	11	12	11	11	10	10	10	11	13

NOTES: Companies were ranked individually for each year; therefore, particular companies comprising the size groups may have changed from year to year.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1996-97

Page 1 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
1996								
All Industries.....		4,076,076	339,405	147,701	618,426	422,915	791,806	1,755,822
Manufacturing.....		2,765,725	201,551	109,851	419,199	286,671	600,657	1,147,797
Food, kindred, and tobacco products.....	20,21	350,424	17,940	15,549	55,728	39,762	50,258	171,186
Textiles and apparel.....	22,23	50,569	5,580	(D)	13,795	5,015	16,958	(D)
Lumber, wood products, and furniture.....	24,25	46,587	5,167	(D)	11,230	9,687	9,325	(D)
Paper and allied products.....	26	132,978	3,297	1,097	22,488	9,445	39,157	57,493
Chemicals and allied products.....	28	332,229	14,882	10,517	64,808	50,477	94,658	96,887
Industrial chemicals.....	281-82,286	142,755	4,902	7,083	27,502	15,716	49,707	37,845
Drugs and medicines.....	283	97,142	1,298	(D)	14,776	14,444	34,201	(D)
Other chemicals.....	284-85,287-89	92,333	8,682	(D)	22,530	20,317	10,749	(D)
Petroleum refining and extraction.....	13,29	248,815	4,025	(D)	10,086	(D)	142,384	90,492
Rubber products.....	30	70,598	11,699	9,496	23,791	(D)	5,869	(D)
Stone, clay, and glass products.....	32	37,429	3,830	1,766	9,761	6,374	15,698	0
Primary metals.....	33	103,908	6,473	(D)	18,436	21,358	(D)	34,436
Ferrous metals and products.....	331-32,3398-99	60,179	3,793	(D)	8,802	15,530	(D)	(D)
Nonferrous metals and products.....	333-36	43,729	2,680	(D)	9,635	5,828	12,386	(D)
Fabricated metal products.....	34	95,343	15,960	(D)	21,694	13,931	25,781	(D)
Machinery.....	35	259,426	31,320	(D)	55,447	37,834	70,245	(D)
Office, computing, and accounting machines.....	357	81,929	3,045	(D)	9,976	8,893	27,360	(D)
Other machinery, except electrical.....	351-56,358-59	177,497	28,275	(D)	45,471	28,941	42,884	(D)
Electrical equipment.....	36	334,058	27,254	17,217	60,027	33,196	47,683	148,680
Radio and TV receiving equipment.....	365	7,064	1,302	875	(D)	(D)	0	0
Communication equipment.....	366	51,140	6,075	3,510	(D)	(D)	(D)	(D)
Electronic components.....	367	146,303	9,842	6,691	26,665	16,164	16,723	70,218
Other electrical equipment.....	361-64,369	129,551	10,034	6,142	17,117	6,049	(D)	(D)
Transportation equipment.....	37	500,269	3,357	3,636	13,572	30,538	45,175	403,992
Motor vehicles and motor vehicles equipment..	371	348,614	(D)	(D)	5,876	24,879	40,050	273,012

See explanatory information and SOURCE at end of table.

Table A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1996-97

Page 2 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
1996								
Other transportation equipment.....	373-75,379	25,444	(D)	0	4,619	(D)	(D)	15,984
Aircraft and missiles.....	372,376	126,211	1,643 (S)	(D)	3,078	(D)	(D)	114,997
Professional and scientific instruments.....	38	105,999	13,450	6,662	25,613	10,784	(D)	(D)
Scientific and mechanical measuring instruments...	381-82	48,652	7,103	4,668	9,732	3,365	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	57,346	6,348	1,994	15,882	7,419	(D)	(D)
Other manufacturing industries ¹	27,31,39	97,093	37,318	6,174	12,721	9,826	11,700	19,354
Nonmanufacturing		1,310,352	137,855	37,851	199,227	136,244	191,149	608,026
Transportation and utilities.....	40-42,44-49	456,861	6,367	1,050	52,647	53,346	67,492	275,960
Communications.....	48	211,857	3,419	(D)	(D)	(D)	0	(D)
Telephone communications.....	481	206,298	0	0	0	(D)	0	(D)
Other communications.....	482-484,489	5,559	3,419	(D)	(D)	0	0	0
Electric, gas, and sanitary services.....	49	182,121	802	(D)	46,126	50,330	(D)	(D)
Other transportation and utilities.....	40-42,44-47	62,884	2,146	0	(D)	(D)	(D)	49,177
Trade.....	50-59	274,435	40,249	21,139	31,143	38,012	32,368	111,523
Finance, insurance, and real estate.....	60-65,67	296,786	3,271	905	72,094	20,624	(D)	(D)
Services.....	701,72,73,75-81, 83,84,87,89	235,129	68,045	12,544	36,407	13,258	79,343	25,533
Business services.....	73	103,818	24,615	8,619	20,320	10,065	21,916	18,283
Computer and data processing services	737	81,079	22,761	8,072	17,617	6,508	(D)	(D)
Other business services.....	731-736,738	22,739	1,853	546	2,702	3,558	(D)	(D)
Health services.....	80	12,403	1,564	(D)	1,097	(D)	8,616	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	11,740	1,473	(D)	(D)	0	8,616	0
Other health services.....	802-805,808-809	663	91	(D)	(D)	(D)	0	0

See explanatory information and SOURCE at end of table.

Table A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1996-97

Page 3 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
			1996					
Engineering and management services.....	87	75,448	40,403	2,523	12,664	(D)	15,390	(D)
Engineering, architectural, and surveying.....	871	26,724	5,464	782	6,883	(D)	(D)	0
Research, development, and testing.....	873	39,127	32,882	1,056	(D)	0	(D)	(D)
Other engineering and management services...	872,874	9,598	2,057	685	(D)	0	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	43,460	1,463	(D)	2,326	(D)	33,420	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	47,141	19,922	2,213	6,937	11,004	(D)	(D)
1997								
All Industries.....		4,573,376	383,693	164,954	730,532	579,895	839,149	1,875,152
Manufacturing.....		3,084,508	251,504	138,267	534,768	348,135	627,198	1,184,636
Food, kindred, and tobacco products.....	20,21	363,454	16,182	21,131	54,019	44,600	80,506	147,015
Textiles and apparel.....	22,23	50,725	5,703	3,953	13,939	(D)	14,880	(D)
Lumber, wood products, and furniture.....	24,25	40,866	3,752	4,874	11,246	12,075	8,920	0
Paper and allied products.....	26	134,028	(D)	(D)	21,084	10,439	41,537	56,961
Chemicals and allied products.....	28	349,944	18,911	9,519	72,441	69,419	94,026	85,627
Industrial chemicals.....	281-82,286	142,139	4,868	(D)	34,394	31,571	36,129	(D)
Drugs and medicines.....	283	110,054	3,681	643	16,007	17,871	36,120	35,732
Other chemicals.....	284-85,287-89	97,751	10,363	(D)	22,040	19,977	21,777	(D)
Petroleum refining and extraction.....	13,29	282,521	230	1,767	96,006	0	107,154	77,365
Rubber products.....	30	99,225	40,494	7,945	24,071	(D)	7,492	(D)
Stone, clay, and glass products.....	32	32,914	(D)	(D)	5,376	6,559	17,692	(D)
Primary metals.....	33	133,940	5,937	18,118	23,200	21,734	30,752	34,199
Ferrous metals and products.....	331-32,3398-99	72,704	668	245	9,980	17,755	(D)	(D)
Nonferrous metals and products.....	333-36	61,237	5,269	17,873	13,220	3,979	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1996-97

Page 4 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
1997								
Fabricated metal products.....	34	109,918	19,213	(D)	23,368	14,086	30,142	(D)
Machinery.....	35	327,764	37,523	15,445	65,741	54,395	71,441	83,220
Office, computing, and accounting machines...	357	139,516	6,977	2,068	15,456	24,264	(D)	(D)
Other machinery, except electrical.....	351-56,358-59	188,248	30,546	13,377	50,285	30,131	(D)	(D)
Electrical equipment.....	36	397,253	28,704	16,196	66,144	62,265	47,129	176,815
Radio and TV receiving equipment.....	365	5,896	(D)	(D)	4,164	0	0	0
Communication equipment.....	366	92,058	8,134	(D)	11,670	33,750	0	(D)
Electronic components.....	367	132,461	(D)	5,708	23,625	21,217	25,467	(D)
Other electrical equipment.....	361-64,369	166,838	5,380	6,760	26,685	7,298	21,662	99,053
Transportation equipment.....	37	516,738	7,829	13,846	12,106	18,329	50,569	414,060
Motor vehicles and motor vehicles equipment.....	371	357,701	(D)	13,415	5,180	(D)	44,553	(D)
Other transportation equipment.....	373-75,379	14,141	0	(D)	1,405	(D)	(D)	(D)
Aircraft and missiles.....	372,376	144,896	(D)	(D)	5,521	6,612	(D)	128,270
Professional and scientific instruments.....	38	115,938	13,350	7,552	27,986	11,802	7,410	47,839
Scientific and mechanical measuring instruments...	381-82	57,158	9,294	4,628	9,730	4,591	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	58,781	4,056	2,924	18,256	7,211	(D)	(D)
Other manufacturing industries ¹	27,31,39	129,277	48,438	6,914	18,042	13,506	17,549	24,827
Nonmanufacturing		1,488,869	132,189	26,688	195,764	231,761	211,951	690,517
Transportation and utilities.....	40-42,44-49	661,667	2,944	488	66,140	122,019	71,882	398,195
Communications.....	48	278,724	926	(D)	1,568	72,524	0	(D)
Telephone communications.....	481	270,988	0	0	0	72,524	0	198,463
Other communications.....	482-484,489	7,737	926	(D)	1,568	0	0	(D)
Electric, gas, and sanitary services.....	49	188,859	788	(D)	59,399	(D)	(D)	(D)
Other transportation and utilities.....	40-42,44-47	194,084	1,230	(D)	5,173	(D)	(D)	181,615

See explanatory information and SOURCE at end of table.

Table A-20. Domestic net sales of R&D-performing companies, by industry and size of company: 1996-97

Page 5 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars in millions]					
1997								
Trade.....	50-59	331,046	68,434	4,034	47,493	49,877	55,380	105,828
Finance, insurance, and real estate.....	60-65, 67	226,679	3,403	4,202	29,748	19,579	14,182	155,565
Services.....	701,72,73,75-81, 83,84,87,89	216,994	45,194	17,004	43,889	16,847	(D)	(D)
Business services.....	73	106,900	25,892	7,869	23,221	11,742	14,985	23,191
Computer and data processing services.. ..	737	85,170	24,721	6,791	20,425	(D)	(D)	12,936
Other business services.....	731-736,738	21,730	1,172	1,078	2,796	(D)	(D)	10,255
Health services.....	80	13,039	1,422	641	3,059	0	7,918 (S)	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	11,983	1,180	641	2,244	0	7,918 (S)	0
Other health services.....	802-805,808-809	1,056	242	0	815	0	0	0
Engineering and management services.....	87	54,588	14,890	4,985	8,143	(D)	20,425	(D)
Engineering, architectural, and surveying.....	871	29,944	6,446	1,473	6,309	(D)	(D)	0
Research, development, and testing.....	873	12,407	7,190	1,765	370	(D)	0	(D)
Other engineering and management services.....	872, 874	12,237	1,254	1,746	1,465	(D)	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	42,466	2,990	3,510	9,466	(D)	(D)	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	52,482	12,213	960	8,493	23,439	(D)	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-21. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in
R&D-performing companies, by industry and size of company: 1987-97**

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Percent]											
All Industries ¹		NA	NA	NA	NA	NA	NA	NA	NA	3.4	3.5	3.4	
Distribution by industry:													
Manufacturing.....		4.6	4.5	4.3	4.0	4.2	4.2	3.8	3.6	3.6	4.0	3.9	
Food, kindred, and tobacco products.....	20,21	0.6	(D)	(D)	(D)	0.5	0.5	0.5	0.5	0.5	0.4	0.5	
Textiles and apparel.....	22,23	(D)	(D)	(D)	(D)	0.6	(D)	(D)	(D)	(D)	(D)	(D)	
Lumber, wood products, and furniture.....	24,25	0.6	(D)	0.6	0.6	(D)	(D)	(D)	(D)	(D)	(D)	0.9	
Paper and allied products.....	26	(D)	(D)	0.8	1.0	1.1	(D)	(D)	(D)	(D)	(D)	(D)	
Chemicals and allied products.....	28	5.3	5.3	5.4	5.3	5.4	5.5	(D)	(D)	4.7	(D)	(D)	
Industrial chemicals.....	281-82,286	4.7	4.4	4.2	4.5	4.6	4.6	(D)	(D)	(D)	(D)	(D)	
Drugs and medicines.....	283	(D)	8.8	(D)	(D)	8.9	9.6	12.5	10.2	10.4	10.1	10.5	
Other chemicals.....	284-85,287-89	(D)	3.4	(D)	(D)	3.1	2.7	(D)	(D)	(D)	2.7	(D)	
Petroleum refining and extraction.....	13,29	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.7	(D)	
Rubber products.....	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Stone, clay, and glass products.....	32	2.6	(D)	(D)	(D)	(D)	(D)	1.5	1.7	1.5	1.3	1.8	
Primary metals.....	33	0.9	0.8	0.8	0.8	0.8	0.6	0.7	0.6	0.5	(D)	0.7	
Ferrous metals and products.....	331-32,3398-99	(D)	0.5	(D)	(D)	(D)	(D)	0.5	(D)	(D)	(D)	(D)	
Nonferrous metals and products.....	333-36	(D)	1.0	(D)	(D)	(D)	(D)	1.2	(D)	(D)	(D)	(D)	
Fabricated metal products.....	34	1.5	1.3	1.5	1.4	1.5	1.5	1.4	1.2	1.1	(D)	1.6	
Machinery.....	35	(D)	7.7	7.9	7.7	8.1	7.8	4.6	3.8	(D)	5.2	5.6	
Office, computing, and accounting machines....	357	(D)	(D)	(D)	(D)	(D)	(D)	9.9	7.9	(D)	(D)	9.2	
Other machinery, except electrical.....	351-56,358-59	3.0	2.9	(D)	(D)	(D)	(D)	2.6	2.5	2.4	(D)	3.0	
Electrical equipment.....	36	8.2	7.5	7.3	6.5	6.5	5.6	6.2	5.9	6.0	6.7	6.2	
Radio and TV receiving equipment.....	365	3.2	2.4	1.8	1.6	(D)							
Communication equipment.....	366	10.2	10.7	11.6	10.0	(D)							
Electronic components.....	367	10.0	9.0	(D)	8.3	7.9	7.5	8.1	7.5	(D)	(D)	(D)	
Other electrical equipment.....	361-64,369	2.7	2.5	(D)	3.7	(D)	(D)	(D)	(D)	(D)	(D)	2.9	
Transportation equipment.....	37	8.7	8.9	8.1	7.5	7.3	7.1	6.4	5.9	6.1	6.5	6.2	
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Aircraft and missiles.....	372,376	14.7	16.3	13.5	11.8	12.1	11.8	12.5	13.8	12.9	12.9	11.2	

See explanatory information and SOURCE at end of table.

**Table A-21. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in
R&D-performing companies, by industry and size of company: 1987-97**

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Percent]											
Distribution by industry:													
Professional and scientific instruments.....	38	7.9	7.4	7.2	8.0	9.1	9.4	9.7	9.2	10.3	11.5	11.6	
Scientific and mechanical measuring instruments...	381-82	(D)	7.9	7.4	8.6	10.0	10.6	11.5	11.0	12.4	(D)	14.2	
Optical, surgical, photographic, and other instruments.....	384-87	(D)	7.3	7.3	7.7	8.1	8.3	8.1	7.3	8.2	(D)	9.1	
Other manufacturing industries ²	27,31,39	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	2.2	
Nonmanufacturing ¹		NA	NA	NA	NA	NA	NA	NA	NA	0.0	0.0	0.0	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	1.2	1.0	0.5	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	3.0	1.3	0.7	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	0.3	0.2	(D)	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	(D)	2.3	(D)	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	7.8	8.1	10.3	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	10.1	10.2	11.2	
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	11.8	(D)	13.7	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	1.6	(D)	1.2	
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	5.2	(D)	(D)	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	(D)	6.1	(S)	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	4.6	
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	7.8	9.7	17.0	
Engineering, architectural, and surveying.....	871	NA	NA	NA	NA	NA	NA	NA	NA	5.7	6.2	6.8	
Research, development, and testing....	873	NA	NA	NA	NA	NA	NA	NA	NA	(D)	14.0	(D)	

See explanatory information and SOURCE at end of table.

Table A-21. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Percent]											
Distribution by industry:													
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	(D)	1.8	(D)	
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	0.6	(D)	(D)	
Other nonmanufacturing industries ²	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	0.8	(D)	3.1	
Distribution by size of company:													
[Number of employees]													
Total ¹		NA	NA	NA	NA	NA	NA	NA	NA	0.0	0.0	0.0	
Fewer than 500.....		NA	NA	NA	NA	NA	NA	NA	NA	4.4	6.0	6.3	
500 to 999.....		NA	NA	NA	NA	NA	NA	NA	NA	3.2	3.1	3.0	
1,000 to 4,999.....		NA	NA	NA	NA	NA	NA	NA	NA	2.8	3.0	2.7	
5,000 to 9,999.....		NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.7	2.5	
10,000 to 24,999.....		NA	NA	NA	NA	NA	NA	NA	NA	2.3	2.5	2.6	
25,000 or more.....		NA	NA	NA	NA	NA	NA	NA	NA	4.3	4.0	3.9	

¹ Beginning in 1995, this table included both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years.

² Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-22. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1987-97

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
		[Percent]										
All Industries ¹		NA	NA	NA	NA	NA	NA	NA	NA	2.8	3.0	2.9
Distribution by industry:												
Manufacturing.....		3.1	3.1	3.1	3.1	3.2	3.3	3.1	2.9	2.9	3.3	3.3
Food, kindred, and tobacco products.....	20,21	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5
Textiles and apparel.....	22,23	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.9	0.8	0.9
Lumber, wood products, and furniture.....	24,25	0.6	0.6	0.6	0.6	0.9	0.9	0.7	0.6	0.7	1.4	0.9
Paper and allied products.....	26	0.6	0.8	0.8	1.0	1.1	1.0	1.1	1.0	1.0	1.2	1.1
Chemicals and allied products.....	28	5.2	5.2	5.4	5.3	5.3	5.4	6.0	5.1	4.7	5.3	5.3
Industrial chemicals.....	281-82,286	4.4	4.2	4.1	4.4	4.4	4.4	4.4	3.3	3.9	3.7	3.5
Drugs and medicines.....	283	8.7	8.8	8.9	8.8	8.9	9.6	12.5	10.2	10.4	10.1	10.5
Other chemicals.....	284-85,287-89	3.3	3.4	3.9	3.4	3.0	2.7	2.7	2.5	1.4	2.7	2.1
Petroleum refining and extraction.....	13,29	1.0	1.0	0.9	0.9	1.0	0.9	0.9	0.8	0.7	0.7	0.6
Rubber products.....	30	1.6	1.7	1.9	2.1	2.3	2.3	2.1	2.3	1.6	1.8	1.4
Stone, clay, and glass products.....	32	2.5	2.0	1.8	1.7	1.6	1.6	1.5	1.5	1.5	1.2	1.8
Primary metals.....	33	0.9	0.7	0.7	0.8	0.8	0.6	0.7	0.6	0.5	0.6	0.6
Ferrous metals and products.....	331-32,3398-99	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3	0.4	0.6
Nonferrous metals and products.....	333-36	1.3	1.0	1.0	1.2	1.2	0.7	1.2	0.9	0.7	1.0	0.6
Fabricated metal products.....	34	1.2	1.1	1.2	1.1	1.2	1.1	1.1	1.0	1.1	1.4	1.5
Machinery.....	35	7.1	6.8	7.3	7.2	7.5	7.3	4.5	3.8	3.6	5.1	5.6
Office, computing, and accounting machines.....	357	12.3	11.2	13.1	14.4	14.9	13.7	9.8	7.9	8.1	9.9	9.2
Other machinery, except electrical.....	351-56,358-59	3.0	2.8	2.6	2.3	2.9	2.9	2.5	2.5	2.4	2.9	3.0
Electrical equipment.....	36	5.4	5.3	5.2	4.5	4.3	4.0	5.4	5.2	5.4	6.1	5.7
Radio and TV receiving equipment.....	365	3.2	2.4	1.8	1.6	1.0	0.6	4.0	1.0	1.6	2.0	2.6
Communication equipment.....	366	5.5	6.1	6.8	6.1	(S)	7.0	10.1	10.3	8.0	8.5	8.0
Electronic components.....	367	8.5	8.0	7.7	7.4	7.2	7.0	7.8	7.3	8.0	8.5	8.1
Other electrical equipment.....	361-64,369	2.6	2.3	2.3	2.2	2.2	2.1	2.3	2.1	2.5	2.6	2.7
Transportation equipment.....	37	3.4	3.5	3.5	3.4	4.0	4.2	3.9	3.7	3.6	4.1	3.8
Motor vehicles and motor vehicles equipment....	371	3.4	3.4	3.7	3.7	4.1	4.0	3.7	3.4	3.6	4.2	3.8

See explanatory information and SOURCE at end of table.

Table A-22. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1987-97

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
		[Percent]										
Distribution by industry:												
Other transportation equipment.....	373-75,379	2.5	2.6	2.5	2.1	2.1	2.1	1.9	1.2	0.9	1.2	2.2
Aircraft and missiles.....	372,376	3.6	3.9	3.3	3.1	4.0	4.7	4.7	5.3	4.2	4.5	3.9
Professional and scientific instruments.....	38	7.5	7.1	6.8	7.1	7.1	7.2	7.2	6.5	7.3	7.7	7.7
Scientific and mechanical measuring instruments.....	381-82	8.1	7.6	6.9	6.9	6.3	6.2	6.4	5.8	6.6	6.7	6.5
Optical, surgical, photographic, and other instruments.....	384-87	7.2	7.1	7.1	7.5	8.0	8.2	7.9	7.2	8.0	8.6	8.9
Other manufacturing industries ²	27,31,39	1.1	1.0	0.9	0.9	0.8	1.3	1.3	1.1	1.2	2.5	2.0
Nonmanufacturing ¹		NA	NA	NA	NA	NA	NA	NA	NA	2.4	2.2	2.2
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	1.1	1.0	0.4
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	2.2	1.9	0.7
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	2.1	1.9	0.7
Other communications.....	482-84,489	NA	NA	NA	NA	NA	NA	NA	NA	3.0	1.3	0.7
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	0.2	0.2	0.1
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	0.1	0.3	0.3
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	2.4	2.3	2.4
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	0.7	0.4	0.7
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	5.9	6.8	8.6
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	9.5	9.9	10.8
Computer and data processing services....	737	NA	NA	NA	NA	NA	NA	NA	NA	11.1	12.4	13.3
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	0.9	1.1	1.1
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	5.2	5.9 (S)	5.2
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	5.3	6.1 (S)	(D)
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	2.4 (S)	3.4	(D)

See explanatory information and SOURCE at end of table.

Table A-22. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
		[Percent]										
Distribution by industry:												
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	4.1	6.1	10.8
Engineering, architectural, and surveying.....	871	NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.5	2.6
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	7.2	9.7	38.5
Other engineering and management services...	872,874	NA	NA	NA	NA	NA	NA	NA	NA	1.7	1.3	2.8
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.7	1.0
Other nonmanufacturing industries ²	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	0.8	2.5	2.9
Distribution by size of company:												
[Number of employees]												
Total ¹		NA	NA	NA	NA	NA	NA	NA	NA	2.8	3.0	2.9
Fewer than 500.....		NA	NA	NA	NA	NA	NA	NA	NA	3.9	5.3	5.7
500 to 999.....		NA	NA	NA	NA	NA	NA	NA	NA	3.0	3.0	2.8
1,000 to 4,999.....		NA	NA	NA	NA	NA	NA	NA	NA	2.6	2.9	2.6
5,000 to 9,999.....		NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.6	2.4
10,000 to 24,999.....		NA	NA	NA	NA	NA	NA	NA	NA	2.0	2.4	2.5
25,000 or more.....		NA	NA	NA	NA	NA	NA	NA	NA	3.1	2.9	2.9

¹ Beginning in 1995, this table included both manufacturing and nonmanufacturing companies. Only manufacturing companies were included in prior years.

² Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-23. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in R&D-performing companies,
by industry and ranked by size of R&D program: 1997**

Page 1 of 3

Industry	SIC code	Total R&D funds as a percent of net sales			Total R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
All Industries		7.5	12.2	8.7	21,364	12,278	20,807
Manufacturing.....		7.5	12.2	8.1	21,364	12,278	20,036
Food, kindred, and tobacco products.....	20,21	1.2	0.5	0.4	679	257	303
Textiles and apparel.....	22,23	2.1	1.2	0.6	235	60	68
Lumber, wood products, and furniture.....	24,25	3.0	0.7	0.6	145	52	59
Paper and allied products.....	26	2.4	1.1	0.5	995 (S)	171	199
Chemicals and allied products.....	28	10.5	5.9	10.9	4,380	3,366	5,510
Industrial chemicals.....	281-82,286	6.3	6.2	3.5	2,490	1,027	1,157
Drugs and medicines.....	283	10.5	9.2	17.4	4,380	2,888	3,457
Other chemicals.....	284-85,287-89	3.5	2.2	1.5	1,076	198	344
Petroleum refining and extraction.....	13,29	1.3	0.6	0.2	1,036	455	115
Rubber products.....	30	4.1	2.1	2.5	546	130	211
Stone, clay, and glass products.....	32	2.8	1.6	1.2	377	99	96
Primary metals.....	33	3.4	0.3	0.6	439	99	141
Ferrous metals and products.....	331-32,3398-99	1.1	0.5	0.6	335	49	75
Nonferrous metals and products.....	333-36	1.2	0.6	0.7	203	52	59
Fabricated metal products.....	34	3.9	1.6	0.9	676	188	191
Machinery.....	35	11.8	6.4	7.4	8,186	1,959	3,093
Office, computing, and accounting machines..	357	11.8	8.7	9.5	8,186	1,668	1,803
Other machinery, except electrical.....	351-56,358-59	5.5	4.7	3.3	1,625	646	785
Electrical equipment.....	36	7.3	12.4	8.7	9,605	3,732	3,553
Radio and TV receiving equipment.....	365	3.0	4.5	1.0	131	10	13
Communication equipment.....	366	14.1	8.5	9.5	5,161	748	776
Electronic components.....	367	12.5	7.6	9.6	6,616	1,163	1,583
Other electrical equipment.....	361-64,369	3.5	3.8	2.3	3,147	464	442

See explanatory information and SOURCE at end of table.

**Table A-23. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in R&D-performing companies,
by industry and ranked by size of R&D program: 1997**

Page 2 of 3

Industry	SIC code	Total R&D funds as a percent of net sales			Total R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Transportation equipment.....	37	7.5	6.7	4.6	21,364	6,559	3,057
Motor vehicles and motor vehicles equipment.....	371	5.2	0.9	1.4	14,233	297	333
Other transportation equipment.....	373-75,379	4.6	2.9	2.3	570	34	6
Aircraft and missiles.....	372,376	12.6	10.5	5.2	12,354	3,232	683
Professional and scientific instruments.....	38	16.3	13.2	11.4	7,011	1,473	1,505
Scientific and mechanical measuring instruments.....	381-82	20.6	11.6	11.1	5,455	556	643
Optical, surgical, photographic, and other instruments.....	384-87	11.0	13.4	8.9	3,029	580	815
Other manufacturing industries ¹	27,31,39	3.1	2.7	0.9	296	142	156
Nonmanufacturing		0.2	0.0	0.1	5,010	2,624	2,905
Transportation and utilities.....	40-42,44-49	1.6	0.3	0.4	1,835	231	261
Communications.....	48	1.5	0.3	0.3	1,796	170	69
Telephone communications.....	481	1.5	0.3	0.1	1,796	170	(D)
Other communications.....	482-484,489	3.2	0.2	0.7	36	9	4
Electric, gas, and sanitary services.....	49	0.4	0.2	0.2	117	40 (S)	71
Other transportation and utilities.....	40-42,44-47	0.6	0.1	0.1	186	22	14
Trade.....	50-59	8.8	19.7	1.5	2,337	565	883
Finance, insurance, and real estate.....	60-65,67	2.4	0.2	0.2	588	203	149
Services.....	701,72,73,75-81, 83,84,87,89	23.6	17.2	24.3	4,243	1,250	1,838
Business services.....	73	23.3	16.5	19.2	2,994	903	1,360
Computer and data processing services.....	737	23.3	16.5	19.2	2,994	903	1,360
Other business services.....	731-736,738	3.9	1.9	0.7	129	36	54

See explanatory information and SOURCE at end of table.

**Table A-23. Total (company, Federal, and other) industrial R&D funds as a percent of net sales in R&D-performing companies,
by industry and ranked by size of R&D program: 1997**

Page 3 of 3

Industry	SIC code	Total R&D funds as a percent of net sales			Total R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Health services.....	80	11.6	1.0	0.8	(D)	17	22
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	9.3	7.9	0.3	(D)	14	8
Other health services.....	802-805,808-809	4.7	3.3	0.0	36	3	0
Engineering and management services.....	87	39.1	51.4	75.1	1,954 (S)	419	720
Engineering, architectural, and surveying.....	871	22.5	10.9	6.5	396	204	291
Research, development, and testing.....	873	47.4	88.4	58.7	1,912 (S)	345	600
Other engineering and management services....	872, 874	4.9	12.5	0.3	107	34	23
Other services.....	701,72,75-79,81, 83,84,89	0.7	1.6	0.2	119	21	19
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	2.3	0.9	0.5	212	41	53

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTE: Rankings were based on total (company, Federal, and other) R&D funds.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-24. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry
and ranked by size of company-financed R&D program: 1997**

Page 1 of 3

Industry	SIC code	Company and other R&D funds as a percent of net sales			Company and other R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
All Industries		6.7	8.4	5.9	17,685	9,600	14,920
Manufacturing.....		6.7	8.4	5.7	17,685	9,600	14,223
Food, kindred, and tobacco products.....	20,21	1.2	0.5	0.4	679	257	303
Textiles and apparel.....	22,23	2.1	1.2	0.6	235	60	68
Lumber, wood products, and furniture.....	24,25	3.0	0.7	0.6	145	52	59
Paper and allied products.....	26	2.3	1.1	0.5	950 (S)	171	199
Chemicals and allied products.....	28	10.5	5.9	11.9	4,380	3,364	5,307
Industrial chemicals.....	281 82,286	6.1	3.9	3.4	2,335	710	1,109
Drugs and medicines.....	283	10.5	9.2	17.4	4,380	2,888	3,457
Other chemicals.....	284 85,287 89	3.5	2.2	1.4	1,076	198	340
Petroleum refining and extraction.....	13,29	1.3	0.6	0.2	1,036	448	114
Rubber products.....	30	4.1	2.1	2.6	546	130	204
Stone, clay, and glass products.....	32	2.8	1.5	1.1	376	98	96
Primary metals.....	33	0.7	0.7	0.6	246	94	141
Ferrous metals and products.....	331 32,3398 99	0.5	0.5	0.6	142	49	74
Nonferrous metals and products.....	333 36	1.2	0.6	0.7	199	52	59
Fabricated metal products.....	34	3.9	1.4	0.8	676	175	168
Machinery.....	35	11.8	6.3	7.4	8,149	1,927	3,089
Office, computing, and accounting machines...	357	11.8	8.6	9.4	8,149	1,662	1,793
Other machinery, except electrical.....	351 56,358 59	5.4	4.6	3.5	1,593	639	783
Electrical equipment.....	36	11.6	3.8	9.8	8,716	3,471	3,204
Radio and TV receiving equipment.....	365	3.0	4.5	0.8	130	10	11
Communication equipment.....	366	13.5	6.5	5.7	4,710	691	675
Electronic components.....	367	11.3	7.5	9.6	5,999	1,149	1,583
Other electrical equipment.....	361 64,369	3.1	3.8	2.3	2,760	462	441

See explanatory information and SOURCE at end of table.

**Table A-24. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry
and ranked by size of company-financed R&D program: 1997**

Page 2 of 3

Industry	SIC code	Company and other R&D funds as a percent of net sales			Company and other R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Transportation equipment.....	37	4.7	4.1	19.0	14,982	2,635	1,252
Motor vehicles and motor vehicles equipment.....	371	4.7	0.9	1.4	12,925	297	330
Other transportation equipment.....	373 75,379	2.1	2.9	2.3	262	34	6
Aircraft and missiles.....	372,376	4.5	2.6	2.7	4,602	721	336
Professional and scientific instruments.....	38	7.9	7.3	11.7	3,312	881	1,492
Scientific and mechanical measuring instruments..	381 82	4.6	11.2	10.1	1,216	548	606
Optical, surgical, photographic, and other instruments.....	384 87	10.8	13.3	8.8	2,977	577	806
Other manufacturing industries ¹	27,31,39	3.1	2.7	0.9	296	142	156
Nonmanufacturing		0.1	0.1	0.1	4,437	2,163	2,510
Transportation and utilities.....	40 42,44 49	1.5	0.3	0.3	1,673	231	236
Communications.....	48	1.3	0.3	0.3	1,635	170	69
Telephone communications.....	481	1.3	0.3	0.1	1,635	170	(D)
Other communications.....	482 484,489	3.2	0.2	0.7	36	9	4
Electric, gas, and sanitary services.....	49	0.4	0.1	0.2	97	39	67
Other transportation and utilities.....	40 42,44 47	0.6	0.1	0.1	180	17	10
Trade.....	50 59	8.7	19.7	1.5	2,318	565	883
Finance, insurance, and real estate.....	60 65,67	2.4	0.2	0.2	588	203	149
Services.....	701,72,73,75 81, 83,84,87,89	20.6	15.6	25.3	3,239	1,040	1,675
Business services.....	73	23.2	16.5	19.2	2,980	903	1,360
Computer and data processing services...	737	23.2	16.5	19.2	2,980	903	1,360
Other business services.....	731 736,738	3.4	2.2	0.6	125	35	50

See explanatory information and SOURCE at end of table.

**Table A-24. Company and other (except Federal) industrial R&D funds as a percent of net sales in R&D-performing companies, by industry
and ranked by size of company-financed R&D program: 1997**

Page 3 of 3

Industry	SIC code	Company and other R&D funds as a percent of net sales			Company and other R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Health services.....	80	11.6	10.0	6.0	(D)	17	21
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	9.3	7.9	0.3	(D)	14	8
Other health services.....	802 805,808 809	4.7	2.1	0.0	36	2	0
Engineering and management services.....	87	55.7	8.7	62.7	609	291	589
Engineering, architectural, and surveying.....	871	5.8	27.8	1.7	114	60	103
Research, development, and testing.....	873	55.7	8.7	62.7	609	291	589
Other engineering and management services	872,874	4.2	12.5	0.3	92	34	22
Other services.....	701,72,75 79,81, 83,84,89	0.6	0.6	0.3	109	18	19
Other nonmanufacturing industries ¹	07 12,14,15, 161 162,17	2.3	0.9	0.5	212	39	51

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTE: Rankings were based on company and other R&D funds.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-25. Federal industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and ranked by size of federally-financed R&D program: 1997

Page 1 of 3

Industry	SIC code	Federal R&D funds as a percent of net sales			Federal R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
All Industries		10.0	3.7	3.0	9,535	5,514	4,358
Manufacturing.....		10.0	3.0	2.9	(D)	(D)	3,854
Food, kindred, and tobacco product	20,21	0.0	0.0	0.0	0	0	0
Textiles and apparel.....	22,23	0.0	0.0	0.0	(D)	0	0
Lumber, wood products, and furniture.....	24,25	0.0	0.0	0.0	0	0	0
Paper and allied products.....	26	0.2	0.0	0.0	(D)	0	0
Chemicals and allied products.....	28	3.9	0.0	0.0	536 (S)	10	5 (S)
Industrial chemicals.....	281-82,286	3.5	0.0	0.0	(D)	9 (S)	1 (S)
Drugs and medicines.....	283	0.5	0.0	0.0	3 (S)	0	0
Other chemicals.....	284-85,287-89	2.3	0.0	0.0	(D)	0	0
Petroleum refining and extraction.....	13,29	0.0	0.0	0.0	(D)	0	0
Rubber products.....	30	0.5	0.0	0.0	(D)	0	0
Stone, clay, and glass products.....	32	0.1	0.0	0.0	2	0	0
Primary metals.....	33	1.4	0.0	0.0	199	2	0
Ferrous metals and products.....	331-32,3398-99	0.7	0.0	0.0	195	(D)	0
Nonferrous metals and products.....	333-36	0.1	0.0	0.0	6	(D)	0
Fabricated metal products.....	34	1.4	0.0	0.0	46	(D)	0
Machinery.....	35	0.2	0.2	0.1	81	17	6
Office, computing, and accounting machines.....	357	0.1	0.0	0.0	53	0	0
Other machinery, except electrical.....	351-56,358-59	0.2	0.4	0.0	42	8 (S)	2
Electrical equipment.....	36	1.7	1.7	0.4	1,534	151	71
Radio and TV receiving equipment.....	365	0.7	0.0	0.0	(D)	0	0
Communication equipment.....	366	14.8	0.6	0.0	660	15 (S)	(D)
Electronic components.....	367	2.7	0.2	0.0	(D)	15	4
Other electrical equipment.....	361-64,369	0.5	0.1	0.0	411	6	2

See explanatory information and SOURCE at end of table.

Table A-25. Federal industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and ranked by size of federally-financed R&D program: 1997

Page 2 of 3

Industry	SIC code	Federal R&D funds as a percent of net sales			Federal R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Transportation equipment.....	37	9.2	1.7	0.9	8,606	2,802	840
Motor vehicles and motor vehicles equipment.....	371	0.6	0.0	0.0	(D)	(D)	0
Other transportation equipment.....	373-75,379	3.6	0.0	0.0	(D)	0	0
Aircraft and missiles.....	372,376	9.2	4.9	2.5	8,606	1,755	257
Professional and scientific instruments.....	38	16.0	1.2	1.3	4,243	149	74
Scientific and mechanical measuring instruments.....	381-82	16.0	3.9	1.3	4,243	117	42
Optical, surgical, photographic, and other instruments.....	384-87	0.6	0.3	0.0	67	8	1
Other manufacturing industries ¹	27,31,39	0.1	0.0	0.0	7	0	0
Nonmanufacturing		0.1	0.7	0.1	1,759 (S)	236	392
Transportation and utilities.....	40-42,44-49	0.2	0.1	0.0	195	6 (S)	(D)
Communications.....	48	0.2	0.0	0.0	(D)	0	0
Telephone communications.....	481	0.2	0.0	0.0	(D)	0	0
Other communications.....	482-484,489	0.0	0.0	0.0	0	0	0
Electric, gas, and sanitary services.....	49	0.1	0.0	0.0	(D)	(D)	0
Other transportation and utilities.....	40-42,44-47	0.1	0.0	0.0	(D)	0	0
Trade.....	50-59	0.1	0.0	0.0	(D)	0	0
Finance, insurance, and real estate.....	60-65,67	0.2	0.0	0.0	(D)	0	0
Services.....	701,72,73,75-81, 83,84,87,89	35.1	88.2	7.7	1,674 (S)	222	362
Business services.....	73	34.4	4.7	13.1	88	51	63
Computer and data processing services...	737	34.4	4.7	15.6	88	51	60
Other business services.....	731-736,738	5.4	0.0	0.0	11	0	0

See explanatory information and SOURCE at end of table.

Table A-25. Federal industrial R&D funds as a percent of net sales in R&D-performing companies, by industry and ranked by size of federally-financed R&D program: 1997

Page 3 of 3

Industry	SIC code	Federal R&D funds as a percent of net sales			Federal R&D funds		
		First 4 companies	Next 4 companies	Next 12 companies	First 4 companies	Next 4 companies	Next 12 companies
		[Percent]			[Dollars in millions]		
Health services.....	80	0.0	0.0	0.0	2	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	0.0	0.0	0.0	0	0	0
Other health services.....	802-805,808-809	0.3	0.0	0.0	(D)	0	0
Engineering and management services.....	87	35.1	88.2	7.5	1,674 (S)	222	344
Engineering, architectural, and surveying	871	21.6	83.9	4.6	382	172	199
Research, development, and testing.....	873	46.2	37.6	28.2	1,493 (S)	108	119
Other engineering and management services.....	872,874	1.3	0.0	0.0	(D)	0	0
Other services.....	701,72,75-79,81, 83,84,89	8.2	0.0	0.0	14	0	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	0.1	0.0	0.0	3	0	0

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTE: Rankings were based on Federal R&D funds.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-26. Total (company, Federal, and other) funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953-97

Page 1 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 ¹	3,630	17,988	151	748	726	3,598	2,753	13,642
1954 ¹	4,070	19,941	166	813	814	3,988	3,090	15,140
1955 ¹	4,640	22,372	189	911	928	4,474	3,523	16,986
1956.....	6,605	30,764	253	1,178	1,268	5,906	5,084	23,680
1957.....	7,731	34,856	271	1,222	1,670	7,529	5,790	26,105
1958.....	8,389	36,940	295	1,299	1,911	8,415	6,183	27,226
1959.....	9,618	41,908	320	1,394	1,991	8,675	7,307	31,839
1960.....	10,509	45,161	376	1,616	2,029	8,719	8,104	34,826
1961.....	10,908	46,338	395	1,678	1,977	8,398	8,536	36,262
1962.....	11,464	48,087	488	2,047	2,449	10,273	8,527	35,768
1963.....	12,630	52,363	522	2,164	2,457	10,187	9,651	40,012
1964.....	13,512	55,196	549	2,243	2,600	10,621	10,363	42,333
1965.....	14,185	56,831	592	2,372	2,658	10,649	10,935	43,810
1966.....	15,548	60,569	624	2,431	2,843	11,075	12,081	47,063
1967.....	16,385	61,854	629	2,374	2,915	11,004	12,841	48,475
1968.....	17,429	63,057	642	2,323	3,124	11,302	13,663	49,432
1969.....	18,308	63,262	618	2,135	3,287	11,358	14,403	49,768
1970.....	18,067	59,275	602	1,975	3,427	11,243	14,038	46,056
1971.....	18,320	57,143	590	1,840	3,415	10,652	14,315	44,651
1972.....	19,552	58,504	593	1,774	3,514	10,515	15,445	46,215
1973.....	21,249	60,195	631	1,788	3,825	10,836	16,793	47,572
1974.....	22,887	59,493	699	1,817	4,288	11,146	17,900	46,530
1975.....	24,187	57,465	730	1,734	4,570	10,858	18,887	44,873
1976.....	26,997	60,599	819	1,838	5,112	11,475	21,066	47,286
1977.....	29,825	62,882	911	1,921	5,636	11,883	23,278	49,079
1978 ¹	33,304	65,443	1,035	2,034	6,300	12,380	25,969	51,030
1979.....	38,226	69,212	1,158	2,097	7,225	13,082	29,843	54,034
1980 ¹	44,505	73,769	1,325	2,196	8,450	14,006	34,730	57,567
1981.....	51,810	78,488	1,614	2,445	10,699	16,208	39,497	59,835
1982 ¹	58,650	83,583	1,904	2,713	12,323	17,562	44,423	63,308
1983.....	65,268	89,213	2,223	3,039	13,927	19,036	49,118	67,138
1984.....	74,800	98,525	2,608	3,435	15,765	20,765	56,427	74,324
1985.....	84,239	107,270	2,862	3,644	18,255	23,246	63,122	80,379
1986.....	87,823	108,989	4,047	5,022	19,759	24,521	64,017	79,445
1987.....	92,155	110,950	4,324	5,206	19,813	23,854	68,018	81,890
1988.....	97,015	112,690	4,500	5,227	20,748	24,100	71,767	83,363
1989.....	102,055	113,748	5,216	5,814	22,691	25,291	74,148	82,644

See explanatory information and SOURCE at end of table

Table A-26. Total (company, Federal, and other) funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953-97

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990.....	109,727	117,230	5,128	5,479	24,785	26,480	79,814	85,271
1991.....	116,952	120,173	7,837	8,053	27,446	28,202	81,669	83,918
1992.....	119,110	119,110	7,002	7,002	26,168	26,168	85,940	85,940
1993.....	117,400	114,380	6,919	6,741	24,686	24,051	85,796	83,589
1994.....	119,595	113,802	7,017	6,677	23,490	22,352	89,088	84,773
1995.....	132,103	122,875	6,099	5,673	27,454	25,536	98,552	91,668
1996.....	144,667	132,080	8,207	7,493	29,241	26,697	107,218	97,889
1997.....	157,539	141,202	10,419	9,339	32,642	29,257	114,478	102,606

¹ Character-of-work estimates were made by the National Science Foundation. See: National Science Foundation, *National Patterns of R&D Resources: 1996*, Final report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (1992) dollars.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-27. Company and other (except Federal) funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953-97

Page 1 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 ¹	2,200	10,902	132	654	438	2,170	1,630	8,077
1954 ¹	2,320	11,367	143	701	492	2,411	1,685	8,256
1955 ¹	2,460	11,861	162	781	560	2,700	1,738	8,380
1956.....	3,277	15,263	216	1,006	794	3,698	2,267	10,559
1957.....	3,396	15,311	230	1,037	992	4,472	2,174	9,802
1958.....	3,630	15,984	252	1,110	1,137	5,007	2,241	9,868
1959.....	3,983	17,355	248	1,081	1,178	5,133	2,557	11,142
1960.....	4,428	19,029	297	1,276	1,196	5,140	2,935	12,613
1961.....	4,668	19,830	314	1,334	1,165	4,949	3,189	13,547
1962.....	5,029	21,095	345	1,447	1,438	6,032	3,246	13,616
1963.....	5,360	22,222	375	1,555	1,450	6,012	3,535	14,656
1964.....	5,792	23,660	384	1,569	1,560	6,373	3,848	15,719
1965.....	6,445	25,821	406	1,627	1,620	6,490	4,419	17,704
1966.....	7,216	28,111	451	1,757	1,804	7,028	4,961	19,326
1967.....	8,020	30,276	427	1,612	1,849	6,980	5,744	21,684
1968.....	8,869	32,088	462	1,671	2,081	7,529	6,326	22,887
1969.....	9,857	34,060	458	1,583	2,272	7,851	7,127	24,627
1970.....	10,288	33,753	444	1,457	2,378	7,802	7,466	24,495
1971.....	10,654	33,231	456	1,422	2,441	7,614	7,757	24,195
1972.....	11,535	34,515	463	1,385	2,562	7,666	8,510	25,464
1973.....	13,104	37,122	499	1,414	2,832	8,023	9,773	27,686
1974.....	14,667	38,126	536	1,393	3,263	8,482	10,868	28,251
1975.....	15,582	37,021	573	1,361	3,440	8,173	11,569	27,486
1976.....	17,436	39,138	634	1,423	3,912	8,781	12,890	28,934
1977.....	19,340	40,776	701	1,478	4,311	9,089	14,328	30,209
1978 ¹	22,115	43,456	785	1,543	4,870	9,570	16,460	32,344
1979.....	25,708	46,547	893	1,617	5,670	10,266	19,145	34,664
1980 ¹	30,476	50,515	1,035	1,716	6,550	10,857	22,891	37,943
1981.....	35,428	53,671	1,313	1,989	8,359	12,663	25,756	39,018
1982 ¹	40,105	57,154	1,523	2,170	9,363	13,343	29,219	41,640
1983.....	44,588	60,946	1,760	2,406	10,286	14,060	32,542	44,481
1984.....	51,404	67,708	2,132	2,808	11,541	15,202	37,731	49,698
1985.....	57,043	72,638	2,373	3,022	12,908	16,437	41,762	53,180
1986.....	59,932	74,376	3,496	4,339	15,082	18,717	41,354	51,320
1987.....	61,403	73,926	3,583	4,314	15,153	18,243	42,667	51,369
1988.....	66,672	77,445	3,507	4,074	16,531	19,202	46,634	54,169
1989.....	73,501	81,923	3,832	4,271	17,993	20,055	51,676	57,597

See explanatory information and SOURCE at end of table.

Table A-27. Company and other (except Federal) funds for performance of industrial basic research, applied research, and development, in current and in constant dollars: 1953-97

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990.....	81,602	87,182	3,760	4,017	18,432	19,692	59,410	63,472
1991.....	90,580	93,074	6,125	6,294	21,425	22,015	63,030	64,766
1992.....	94,388	94,388	5,816	5,816	21,184	21,184	67,385	67,385
1993.....	94,591	92,158	5,961	5,808	19,956	19,443	68,678	66,912
1994.....	97,131	92,426	6,078	5,784	19,372	18,434	71,683	68,211
1995.....	108,652	101,062	5,379	5,003	23,755	22,096	79,516	73,961
1996.....	121,015	110,486	6,848	6,252	25,370	23,163	88,798	81,072
1997.....	133,611	119,755	8,766	7,857	29,782	26,694	95,064	85,206

¹ Character-of-work estimates were made by the National Science Foundation. See: National Science Foundation, *National Patterns of R&D Resources: 1996*, Final report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (1992) dollars.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-28. Federal funds for performance of industrial basic research, applied research, and development,
in current and in constant dollars: 1953-97**

Page 1 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1953 ¹	1,430	7,086	19	94	288	1,427	1,123	5,565
1954 ¹	1,750	8,574	23	113	322	1,578	1,405	6,884
1955 ¹	2,180	10,511	27	130	368	1,774	1,785	8,607
1956.....	3,328	15,501	37	172	474	2,208	2,817	13,121
1957.....	4,335	19,545	41	185	678	3,057	3,616	16,303
1958.....	4,759	20,956	43	189	774	3,408	3,942	17,358
1959.....	5,635	24,553	72	314	813	3,542	4,750	20,697
1960.....	6,081	26,132	79	339	833	3,580	5,169	22,213
1961.....	6,240	26,508	81	344	812	3,449	5,347	22,715
1962.....	6,434	26,988	143	600	1,011	4,241	5,281	22,152
1963.....	7,270	30,141	147	609	1,007	4,175	6,116	25,357
1964.....	7,720	31,536	165	674	1,040	4,248	6,515	26,614
1965.....	7,740	31,010	186	745	1,038	4,159	6,516	26,106
1966.....	8,332	32,458	173	674	1,039	4,048	7,120	27,737
1967.....	8,365	31,578	202	763	1,066	4,024	7,097	26,791
1968.....	8,560	30,970	180	651	1,043	3,774	7,337	26,545
1969.....	\$8,451	29,202	160	553	1,015	3,507	7,276	25,142
1970.....	7,779	25,522	158	518	1,049	3,442	6,572	21,562
1971.....	7,666	23,911	134	418	974	3,038	6,558	20,455
1972.....	8,017	23,989	130	389	952	2,849	6,935	20,751
1973.....	8,145	23,074	132	374	993	2,813	7,020	19,887
1974.....	8,220	21,367	163	424	1,025	2,664	7,032	18,279
1975.....	8,605	20,444	157	373	1,130	2,685	7,318	17,387
1976.....	9,561	21,461	185	415	1,200	2,694	8,176	18,352
1977.....	10,485	22,106	210	443	1,325	2,794	8,950	18,870
1978 ¹	11,189	21,987	250	491	1,430	2,810	9,509	18,685
1979.....	12,518	22,665	265	480	1,555	2,815	10,698	19,370
1980 ¹	14,029	23,254	290	481	1,900	3,149	11,839	19,624
1981.....	16,382	24,817	301	456	2,340	3,545	13,741	20,817
1982 ¹	18,545	26,429	381	543	2,960	4,218	15,204	21,667
1983.....	20,680	28,267	463	633	3,641	4,977	16,576	22,657
1984.....	23,396	30,817	476	627	4,224	5,564	18,696	24,626
1985.....	27,196	34,631	489	623	5,347	6,809	21,360	27,200
1986.....	27,891	34,613	551	684	4,678	5,805	22,662	28,124
1987.....	30,752	37,024	740	891	4,660	5,610	25,352	30,523
1988.....	30,343	35,246	993	1,153	4,217	4,898	25,133	29,194
1989.....	28,554	31,826	1,384	1,543	4,698	5,236	22,472	25,047

See explanatory information and SOURCE at end of table.

**Table A-28. Federal funds for performance of industrial basic research, applied research, and development,
in current and in constant dollars: 1953-97**

Page 2 of 2

Year	Total		Basic research		Applied research		Development	
	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars	Current dollars	Constant 1992 dollars
	[Dollars in millions]							
1990.....	28,125	30,048	1,368	1,462	6,353	6,787	20,404	21,799
1991.....	26,372	27,098	1,712	1,759	6,021	6,187	18,639	19,152
1992.....	24,722	24,722	1,186	1,186	4,983	4,983	18,555	18,555
1993.....	22,809	22,222	958	933	4,730	4,608	17,118	16,678
1994.....	22,463	21,375	939	894	4,119	3,919	17,405	16,562
1995.....	23,451	21,813	720	670	3,699	3,441	19,031	17,702
1996.....	23,653	21,595	1,358	1,240	3,871	3,534	18,423 (S)	16,820
1997.....	23,928	21,447	1,654	1,482	2,861	2,564	19,412	17,399

¹ Character-of-work estimates were made by the National Science Foundation. See: National Science Foundation, *National Patterns of R&D Resources: 1996*, Final report, NSF 96-333.

NOTES: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

Gross domestic product (GDP) implicit price deflators were used to convert current dollars to constant (1992) dollars.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-29. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1995

Page 1 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries.....		132,103	23,451	108,652	6,099	720	5,379	27,454	3,699	23,755	98,552	19,031	79,516
Manufacturing.....		100,067	18,831	81,236	3,849	290	3,559	20,416	2,140	18,276	75,804	16,399	59,401
Food, kindred, and tobacco products	20,21	1,566	0	1,566	153	0	153	510	0	510	903	0	903
Textiles and apparel.....	22,23	(D)	(D)	381	29	0	29	(D)	(D)	49	(D)	(D)	303
Lumber, wood products, and furniture.....	24,25	(D)	(D)	229	21	0	21	38	0	38	(D)	(D)	169
Paper and allied products.....	26	(D)	(D)	1,404	245 (S)	0	245 (S)	(D)	(D)	720 (S)	439	0	439
Chemicals and allied products.....	28	17,547	210 (S)	17,337	(D)	(D)	1,616	(D)	(D)	5,666	10,241	187 (S)	10,055
Industrial chemicals.....	281-82,286	(D)	(D)	5,139	(D)	(D)	514	(D)	(D)	1,437	(D)	(D)	3,188
Drugs and medicines.....	283	10,215	14	10,202	1,018	2	1,016	3,513	5	3,508	5,683	7	5,677
Other chemicals.....	284-85, 287-89	(D)	(D)	1,996	(D)	(D)	86	(D)	(D)	720	(D)	(D)	1,190
Petroleum refining and extraction.....	13,29	1,760	6	1,754	115	0	115	(D)	(D)	719	(D)	(D)	920
Rubber products.....	30	(D)	(D)	1,210	67	0	67	(D)	(D)	229	(D)	(D)	915
Stone, clay, and glass products.....	32	448	6	441	17	0	17	(D)	(D)	151	(D)	(D)	273
Primary metals.....	33	593	13	580	47	0	47	(D)	(D)	184	(D)	(D)	349
Ferrous metals and products.....	331-32, 3398-99	(D)	(D)	217	14	0	14	85	0	85	(D)	(D)	118
Nonferrous metals and products.....	333-36	(D)	(D)	363	33	0	33	(D)	(D)	100	235	5	231
Fabricated metal products.....	34	1,023	86	937	(D)	(D)	68	156	13	143	(D)	(D)	726
Machinery.....	35	(D)	(D)	9,676	(D)	(D)	261	2,431	29	2,402	7,067	54	7,012
Office, computing, and accounting machines.....	357	(D)	(D)	4,699	(D)	(D)	24	(D)	(D)	1,323	(D)	(D)	3,352 (S)
Other machinery, except electrical.....	351-56, 358-59	5,041	64	4,976	(D)	(D)	238	(D)	(D)	1,079	(D)	(D)	3,660
Electrical equipment.....	36	18,751	1,690	17,060	(D)	(D)	240	(D)	(D)	3,279	14,612	1,070	13,541
Radio and TV receiving equipment.....	365	(D)	(D)	114	5	0	5	16	0	16	(D)	(D)	94

See explanatory information and SOURCE at end of table.

Table A-29. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1995

Page 2 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Communication equipment.....	366	(D)	(D)	3,845	56	0	56	(D)	(D)	664	3,644	519	3,125
Electronic components.....	367	(D)	(D)	9,628	(D)	(D)	88	2,435	430	2,005	7,705	169	7,535
Other electrical equipment.....	361-64,369	(D)	(D)	3,473	(D)	(D)	91	(D)	(D)	595	(D)	(D)	2,787
Transportation equipment.....	37	32,441	13,130	19,311	348	250	98	2,791	705	2,086	29,302	12,175	17,127
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	13,590	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12,885
Other transportation equipment.....	373-75,379	(D)	(D)	232	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	179
Aircraft and missiles.....	372,376	16,951	11,462	5,489	252	250	2	1,987	564	1,423	14,712	10,648	4,064
Professional and scientific instruments.....	38	11,976	3,460 (S)	8,516	(D)	(D)	499	(D)	(D)	2,015	8,812	2,810 (S)	6,002
Scientific and mechanical measuring instruments.....	381-82	7,146	3,358 (S)	3,787	(D)	(D)	257	(D)	(D)	1,406	(D)	(D)	2,125
Optical, surgical, photographic, and other instruments.....	384-87	4,831	102	4,729	(D)	(D)	242	634	24	610	(D)	(D)	3,877
Other manufacturing industries.....	27,31,39	(D)	(D)	835	(D)	(D)	83	84	0	84	668	0	668
Nonmanufacturing.....		32,036	4,620	27,415	2,250	430	1,820	7,038	1,558	5,480	22,748	2,632	20,115
Transportation and utilities.....	40-42,44-49	5,435	252	5,183	(D)	(D)	116	(D)	(D)	953	4,359	245	4,114
Communications.....	48	(D)	(D)	4,756	(D)	0	(D)	(D)	0	(D)	(D)	(D)	3,852
Telephone communications.....	481	(D)	(D)	4,697	(D)	0	(D)	(D)	0	(D)	(D)	(D)	3,809
Other communications.....	482-484,489	59	0	59	(D)	0	(D)	(D)	0	(D)	43	0	43
Electric, gas, and sanitary services.....	49	440	93	347	(D)	(D)	48	(D)	(D)	105	280	86	194
Other transportation and utilities.....	40-42,44-47	(D)	(D)	80	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	68
Trade.....	50-59	(D)	(D)	7,514	(D)	(D)	211	(D)	(D)	1,236	(D)	(D)	6,067
Finance, insurance, and real estate.....	60-65,67	(D)	(D)	710	(D)	(D)	115	(D)	(D)	17	(D)	(D)	578
Services.....	701,72,73, 75-81,83,84, 87,89	17,876	4,270	13,606	1,766	420	1,346	4,658	1,537	3,122	11,452	2,312	9,138

See explanatory information and SOURCE at end of table.

Table A-29. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1995

Page 3 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Business services.....	73	9,293	612	8,681	(D)	(D)	(D)	(D)	(D)	(D)	6,972	276	6,695
Computer and data processing services.....	737	9,059	514	8,545	(D)	(D)	569	(D)	(D)	1,376	6,796	196	6,600
Other business services.....	731-736,738	234	98	136	(D)	(D)	(D)	(D)	(D)	(D)	175	80	95
Health services.....	80	756	4	753	(D)	(D)	(D)	237	2	235	(D)	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	(D)	737	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other health services.....	802-805, 808-809	(D)	(D)	16 (S)	1	(D)	(D)	(D)	(D)	(D)	7	0	7
Engineering and management services.....	87	7,662	3,650	4,011	(D)	(D)	(D)	(D)	(D)	(D)	3,887	2,034 (S)	1,852
Engineering, architectural, and surveying.....	871	2,933	1,883	1,050	(D)	(D)	(D)	(D)	(D)	(D)	1,519	1,079	440
Research, development, and testing.....	873	(D)	(D)	2,829	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	1,287
Other engineering and management services.....	872,874	(D)	(D)	132	(D)	(D)	7	(D)	(D)	0	(D)	(D)	125
Other services.....	701,72, 75-79,81, 83,84,89	165	4	160	(D)	(D)	(D)	29	3	26	(D)	(D)	(D)
Other nonmanufacturing industries.....	07-12,14,15, 161-162,17	413	11	402	32	0	32	(D)	(D)	153	(D)	(D)	217

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; therefore, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-30. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1996

Page 1 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries.....		144,667	23,653	121,015	8,207	1,358	6,848	29,241	3,871	25,370	107,218	18,423 (\$)	88,798
Manufacturing.....		111,864	20,020	91,845	(D)	(D)	4,851	(D)	(D)	19,711	83,661	16,379	67,284
Food, kindred, and tobacco products	20,21	1,564	0	1,564	100	0	100	508	0	508	957	0	957
Textiles and apparel.....	22,23	(D)	(D)	414	50	0	50	(D)	(D)	43	(D)	(D)	321
Lumber, wood products, and furniture.....	24,25	(D)	(D)	634	37	0	37	(D)	(D)	122	475	0	475
Paper and allied products.....	26	(D)	(D)	1,534	313 (\$)	0	313 (\$)	(D)	(D)	706 (\$)	(D)	(D)	515
Chemicals and allied products.....	28	(D)	(D)	17,520	1,628	8	1,620	(D)	(D)	5,667	(D)	(D)	10,233
Industrial chemicals.....	281-82,286	(D)	(D)	5,246	(D)	(D)	697	(D)	(D)	1,468	(D)	(D)	3,081
Drugs and medicines.....	283	9,773	3	9,769	(D)	(D)	856	(D)	(D)	3,157	5,758	2 (\$)	5,755
Other chemicals.....	284-85, 287-89	2,505	0	2,505	67	0	67	1,041	0	1,041	1,396	0	1,396
Petroleum refining and extraction.....	13,29	1,654	24	1,630	(D)	(D)	(D)	592	2	590	(D)	(D)	(D)
Rubber products.....	30	(D)	(D)	1,269	(D)	(D)	67	(D)	(D)	251	(D)	(D)	951
Stone, clay, and glass products.....	32	468	5	463	(D)	(D)	21	(D)	(D)	162	(D)	(D)	280
Primary metals.....	33	(D)	(D)	637	(D)	(D)	(D)	(D)	(D)	167	754 (\$)	(D)	(D)
Ferrous metals and products.....	331-32, 3398-99	(D)	(D)	214	6	(D)	(D)	(D)	0	(D)	(D)	(D)	(D)
Nonferrous metals and products.....	333-36	(D)	(D)	422	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	315
Fabricated metal products.....	34	(D)	(D)	1,322	(D)	(D)	140	(D)	(D)	247	(D)	(D)	934
Machinery.....	35	13,455	117	13,338	(D)	(D)	397	(D)	(D)	2,409	10,605	73	10,532
Office, computing, and accounting machines.....	357	(D)	(D)	8,132	(D)	(D)	65	(D)	(D)	1,629	(D)	(D)	6,438
Other machinery, except electrical.....	351-56, 358-59	(D)	(D)	5,206	(D)	(D)	332	(D)	(D)	780	(D)	(D)	4,094
Electrical equipment.....	36	22,498	2,143	20,356	(D)	(D)	531	(D)	(D)	4,926	15,662	764	14,898
Radio and TV receiving equipment.....	365	(D)	(D)	140	22	(D)	(D)	(D)	0	(D)	(D)	(D)	107
Communication equipment.....	366	(D)	(D)	4,359	(D)	(D)	18	(D)	(D)	751	3,999	410	3,590

See explanatory information and SOURCE at end of table.

Table A-30. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1996

Page 2 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Electronic components.....	367	(D)	(D)	12,497	(D)	(D)	(D)	4,799	(D)	(D)	8,767	116	8,651
Other electrical equipment.....	361-64,369	(D)	(D)	3,360	(D)	(D)	228	(D)	(D)	582	(D)	(D)	2,550
Transportation equipment.....	37	32,737	12,202	20,535	(D)	(D)	277	(D)	(D)	2,361	28,648	10,752 (S)	17,898
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	14,528	104	(D)	(D)	(D)	(D)	(D)	(D)	(D)	13,753
Other transportation equipment.....	373-75,379	(D)	(D)	298	(D)	0	(D)	167	(D)	(D)	(D)	(D)	149
Aircraft and missiles.....	372,376	16,224	10,515	5,710	(D)	(D)	108	(D)	(D)	(D)	13,259	9,264 (S)	3,995
Professional and scientific instruments.....	38	12,149	3,942	8,207	(D)	(D)	943	1,099	67	1,032	(D)	(D)	6,232
Scientific and mechanical measuring instruments.....	381-82	(D)	(D)	3,283	(D)	(D)	455	482	31	450	(D)	(D)	2,378
Optical, surgical, photographic, and other instruments.....	384-87	(D)	(D)	4,924	(D)	(D)	488	617	35	582	(D)	(D)	3,854
Other manufacturing industries ¹	27,31,39	(D)	(D)	2,423	(D)	(D)	247	973	455	518	1,738	80	1,658
Nonmanufacturing		32,803	3,633	29,170	(D)	(D)	1,997	(D)	(D)	5,659	23,557	2,044 (S)	21,514
Transportation and utilities.....	40-42,44-49	4,678	186	4,492	(D)	(D)	(D)	(D)	(D)	(D)	3,650	180	3,469
Communications.....	48	(D)	(D)	3,970	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	3,040
Telephone communications.....	481	(D)	(D)	3,897	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	2,982
Other communications.....	482-484,489	73	0	73	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	57
Electric, gas, and sanitary services.....	49	352	42	311	15	0	15	(D)	(D)	73	(D)	(D)	223
Other transportation and utilities.....	40-42,44-47	(D)	(D)	211	(D)	(D)	(D)	(D)	0	(D)	221	12	209
Trade.....	50-59	6,389	51	6,338	(D)	(D)	405	1,462	0	1,462	(D)	(D)	4,471
Finance, insurance, and real estate.....	60-65,67	(D)	(D)	1,280	12	(D)	(D)	(D)	0	(D)	1,177	2	1,174
Services.....	701,72,73, 75-81,83,84, 87,89	19,022	3,118	15,904	1,699	360	1,339	3,952	1,006 (S)	2,946	13,371	1,752 (S)	11,619

See explanatory information and SOURCE at end of table.

Table A-30. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1996

Page 3 of 3

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Business services.....	73	10,641	361	10,280	593	84	509	1,328	51	1,277	8,720	226	8,494
Computer and data processing services.....	737	(D)	(D)	10,025	550	84	467	(D)	(D)	1,244	(D)	(D)	8,314
Other business services.....	731-736,738	(D)	(D)	255	41	0	41	(D)	(D)	33	(D)	(D)	181
Health services.....	80	(D)	(D)	735 (S)	(D)	(D)	50	(D)	(D)	252 (S)	(D)	(D)	433 (S)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	715 (S)	3	713 (S)	48	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other health services.....	802-805, 808-809	(D)	(D)	23	(D)	0	(D)	12	(D)	(D)	(D)	0	(D)
Engineering and management services..	87	7,318	2,746	4,572	1,029	274	757	2,324	949 (S)	1,376	3,965	1,523 (S)	2,439
Engineering, architectural, and surveying.....	871	1,660	994	667	(D)	(D)	(D)	(D)	(D)	(D)	943	546	398
Research, development, and testing.....	873	5,484	1,708 (S)	3,776	795	128	667	1,772	603 (S)	1,168	2,917	977 (S)	1,941
Other engineering and management services.....	872,874	173	45	129	(D)	(D)	(D)	(D)	(D)	(D)	101	1	101
Other services.....	701,72,75-79, 81,83,84,89	(D)	(D)	317	(D)	(D)	25	(D)	(D)	42	(D)	(D)	250
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	(D)	(D)	1,156	46	0	46	547	218	329	(D)	(D)	781

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-31. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1997

Page 1 of 4

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
All Industries.....		157,539	23,928	133,611	10,419	1,654	8,766	32,642	2,861	29,782	114,478	19,412	95,064
Manufacturing.....		121,025	19,823	101,202	(D)	(D)	6,245	(D)	(D)	22,672	89,492	17,204	72,287
Food, kindred, and tobacco products	20,21	1,787	0	1,787	128	0	128	462	0	462	1,197	0	1,197
Textiles and apparel.....	22,23	(D)	(D)	476	41	0	41	34	0	34	(D)	(D)	401 (S)
Lumber, wood products, and furniture.....	24,25	348	0	348	30	0	30	36	0	36	282	0	282
Paper and allied products.....	26	(D)	(D)	1,456	249	8	242	(D)	(D)	307	(D)	(D)	907
Chemicals and allied products.....	28	(D)	(D)	18,628	(D)	(D)	2,710	(D)	(D)	5,103	(D)	(D)	10,815
Industrial chemicals.....	281-82,286	(D)	(D)	4,970	(D)	(D)	727	(D)	(D)	1,470	(D)	(D)	2,773
Drugs and medicines.....	283	11,589	3 (S)	11,586	(D)	(D)	1,893	2,975	0	2,975	(D)	(D)	6,718
Other chemicals.....	284-85, 287-89	(D)	(D)	2,072	91	0	91	(D)	(D)	658	(D)	(D)	1,324
Petroleum refining and extraction.....	13,29	(D)	(D)	1,612	75	0	75	(D)	(D)	666	(D)	(D)	871
Rubber products.....	30	(D)	(D)	1,372	67	0	67	(D)	(D)	235	(D)	(D)	1,071
Stone, clay, and glass products.....	32	608	2	606	(D)	(D)	60	(D)	(D)	210	(D)	(D)	336
Primary metals.....	33	988	221	767	(D)	(D)	49	(D)	(D)	220	717	218 (S)	499
Ferrous metals and products.....	331-32, 3398-99	(D)	(D)	414	(D)	(D)	(D)	(D)	(D)	(D)	507	215 (S)	292
Nonferrous metals and products.....	333-36	(D)	(D)	353	(D)	0	(D)	(D)	(D)	(D)	209	3	206

See explanatory information and SOURCE at end of table.

Table A-31. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1997

Page 2 of 4

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Fabricated metal products.....	34	1,798	129	1,669	(D)	(D)	124	472	112	360	(D)	(D)	1,185
Machinery.....	35	18,499	106	18,393	(D)	(D)	589	(D)	(D)	4,638	13,231	66	13,165
Office, computing, and accounting machines.....	357	12,840	53	12,787	(D)	(D)	220	(D)	(D)	3,751	(D)	(D)	8,816
Other machinery, except electrical.....	351-56, 358-59	5,659	53	5,606	369	0	369	(D)	(D)	888	(D)	(D)	4,350
Electrical equipment.....	36	24,585	1,839	22,747	954	33 (S)	921	6,878	592	6,285	16,753	1,212	15,540
Radio and TV receiving equipment.....	365	(D)	(D)	152	26	0	26	(D)	(D)	12 (S)	(D)	(D)	114
Communication equipment.....	366	(D)	(D)	7,377	(D)	(D)	148	1,107	0	1,107	6,784	662	6,122
Electronic components.....	367	(D)	(D)	10,786	428	0	428	4,658	481 (S)	4,177	(D)	(D)	6,180
Other electrical equipment.....	361-64,369	4,909	477	4,432	(D)	(D)	318	(D)	(D)	989	3,474	349	3,125
Transportation equipment.....	37	31,993	12,251	19,742	(D)	(D)	135	(D)	(D)	2,303	27,945	10,640	17,304
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	13,758	103	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12,960
Other transportation equipment.....	373-75,379	(D)	(D)	307	(D)	0	(D)	(D)	0	(D)	(D)	(D)	185
Aircraft and missiles.....	372,376	16,296	10,619	5,677	(D)	(D)	10	(D)	(D)	1,508	13,275	9,115	4,159
Professional and scientific instruments.....	38	13,458	4,499	8,958	(D)	(D)	942	1,377	91	1,286	(D)	(D)	6,729
Scientific and mechanical measuring instruments.....	381-82	8,135	4,416	3,719	(D)	(D)	407	563	49 (S)	515	(D)	(D)	2,797
Optical, surgical, photographic, and other instruments.....	384-87	5,323	84	5,240	(D)	(D)	535	814	42	772	(D)	(D)	3,932
Other manufacturing industries ¹	27,31,39	2,798	156	2,642	133	0	133	548	21	528	2,117	135	1,982
Nonmanufacturing.....		36,514	\$4,105	32,409	(D)	(D)	2,521	(D)	(D)	\$7,110	24,986	2,207	22,777

See explanatory information and SOURCE at end of table.

Table A-31. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1997

Page 3 of 4

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Transportation and utilities.....	40-42,44-49	3,013	200	2,812	164	0	164	(D)	(D)	1,023	(D)	(D)	1,625
Communications.....	48	(D)	(D)	1,884	(D)	0	(D)	(D)	0	(D)	(D)	(D)	1,174
Telephone communications.....	481	(D)	(D)	1,826	(D)	0	(D)	(D)	0	(D)	(D)	(D)	1,144
Other communications.....	482-484,489	58	0	58	(D)	0	(D)	(D)	0	(D)	30	\$0	30
Electric, gas, and sanitary services.....	49	(D)	(D)	258	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	170
Other transportation and utilities.....	40-42,44-47	(D)	(D)	670	(D)	0	(D)	(D)	0	(D)	(D)	(D)	281
Trade.....	50-59	(D)	(D)	7,961	(D)	(D)	943	(D)	(D)	2,016	(D)	(D)	5,003
Finance, insurance, and real estate.....	60-65,67	(D)	(D)	1,500	13	0	13	(D)	(D)	45	1,442	0	1,442
Services.....	701,72,73, 75-8183,84, 87,89	22,400	3,805	18,594	1,951	665	1,286	4,866	1,160	3,705	15,583	1,979	13,604
Business services.....	73	11,960	400	11,560	(D)	(D)	634	(D)	(D)	1,279	9,874	227	9,647
Computer and data processing services.....	737	11,706	389	11,318	646	18	628	1,404	155	1,249	9,656	216	9,441
Other business services.....	731-736,738	254	11	242	(D)	(D)	6	(D)	(D)	30	218	11	207
Health services.....	80	(D)	(D)	679	(D)	0	(D)	(D)	(D)	(D)	(D)	0	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	4	(D)	15	0	15	(D)	4	(D)	(D)	0	(D)
Other health services.....	802-805, 808-809	49	(D)	(D)	(D)	0	(D)	(D)	(D)	(D)	11	0	11
Engineering and management services	87	9,290	3,381 (S)	5,909	1,273	645	627	3,120	993	2,127	4,898	1,742	3,156
Engineering, architectural, and surveying.....	871	2,039	1,258	781	(D)	(D)	(D)	(D)	(D)	(D)	1,223	705	518
Research, development, and testing.....	873	(D)	(D)	4,782	1,031	475	556	2,353	611	1,742	(D)	(D)	2,484
Other engineering and management services.....	872,874	(D)	(D)	347	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	154

See explanatory information and SOURCE at end of table.

Table A-31. Funds for performance of industrial basic research, applied research, and development, by industry and source of funds: 1997

Page 4 of 4

Industry	SIC code	Total			Basic Research			Applied Research			Development		
		Total	Federal	Company	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
		[Dollars in millions]											
Other services.....	701,72,75-79, 81,83,84,89	(D)	(D)	446	(D)	(D)	(D)	(D)	(D)	(D)	(D)	10	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	1,618	77	1,541	128	12	116	372	51	321	1,118	14	1,104

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTE: The character-of-work estimation procedure was revised for 1986 and later years; hence, these data are not directly comparable with data for 1985 and earlier years. See technical notes for a more complete discussion of this change.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-32. Number of companies conducting industrial basic research and total number of R&D-performing companies, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Size of company													
		Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
All Industries.....		35,112	6,820	31,995	6,310	1,127	140	1,302	232	322	49	199	63	167	25
Manufacturing.....		18,130	3,302	15,898	2,923	886	110	938	163	197	38	138	47	73	21
Food, kindred, and tobacco products.....	20,21	696	137	426	105	112	10	115	10	17	5	15	4	11	2
Textiles and apparel.....	22,23	278	147	181	131	44	4	41	9	3	0	7	3	2	0
Lumber, wood products, and furniture.....	24,25	257	27	162	2	52	18	29	4	10	1	4	1	0	0
Paper and allied products.....	26	121	41	57	32	2	0	41	4	6	2	9	2	6	1
Chemicals and allied products.....	28	602	102	424	42	32	10	95	29	27	9	17	10	6	3
Industrial chemicals.....	281-82,286	161	43	91	18	8	4	42	11	11	3	7	5	2	2
Drugs and medicines.....	283	199	18	159	1	3	1	22	7	7	4	5	4	3	1
Other chemicals.....	284-85,28-89	242	41	174	23	21	5	32	11	9	2	5	1	1	0
Petroleum refining and extraction.....	13,29	26	7	2	0	3	0	11	3	0	0	7	2	3	2
Rubber products.....	30	639	71	459	54	93	4	73	10	7	0	5	2	2	1
Stone, clay, and glass products.....	32	98	63	65	50	10	0	13	6	5	3	5	4	0	0
Primary metals.....	33	250	16	126	8	63	1	31	4	17	2	10	0	3	1
Ferrous metals and products.....	331-32,3398-99	54	3	11	0	4	0	17	3	14	0	8	0	1	0
Nonferrous metals and products.....	333-36	196	13	116	8	59	1	14	1	3	2	2	0	2	1
Fabricated metal products.....	34	903	163	731	131	74	13	74	16	10	0	11	3	2	0
Machinery.....	35	1,536	391	1,233	340	108	21	144	21	28	4	18	4	5	1
Office, computing, and accounting machines.....	357	119	9	77	1	10	1	16	4	8	1	6	1	2	1
Other machinery, except electrical.....	351-56,358-59	1,417	382	1,156	339	98	20	128	17	20	3	12	3	3	0
Electrical equipment.....	36	1,547	232	1,217	185	140	16	136	17	33	7	11	3	11	4
Radio and TV receiving equipment.....	365	19	4	14	3	2	0	3	1	0	0	0	0	0	0
Communication equipment.....	366	322	60	255	53	25	2	23	3	16	1	0	0	3	1
Electronic components.....	367	748	96	625	81	60	5	46	6	10	2	5	2	2	0
Other electrical equipment.....	361-64,369	460	72	323	48	54	9	64	7	7	4	6	1	6	3

See explanatory information and SOURCE at end of table.

Table A-32. Number of companies conducting industrial basic research and total number of R&D-performing companies, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Size of company													
		Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
Transportation equipment.....	37	411	116	302	100	54	2	18	3	14	2	10	5	13	4
Motor vehicles and motor vehicles equipment.....	371	377	107	300	100	51	0	6	1	8	1	8	4	4	1
Other transportation equipment.....	373-75,379	10	3	0	0	2	2	4	0	1	0	1	1	2	0
Aircraft and missiles.....	372,376	24	6	2	0	1	0	8	2	5	1	1	0	7	3
Professional and scientific instruments....	38	760	142	611	109	58	10	74	17	10	3	3	2	5	1
Scientific and mechanical measuring instruments.....	381-82	515	79	440	62	37	8	29	6	4	1	2	1	3	0
Optical, surgical, photographic, and other instruments.....	384-87	246	63	171	47	21	1	45	11	6	2	1	1	2	1
Other manufacturing industries ¹	27,31,39	10,005	1,647	9,901	1,633	40	1	44	11	10	0	6	2	4	1
Nonmanufacturing.....		16,982	3,519	16,097	3,387	241	31	364	69	125	11	61	16	94	4
Transportation and utilities.....	40-42,44-49	417	117	204	104	5	1	65	6	67	2	10	2	66	2
Communications.....	48	90	7	24	4	2	1	4	1	51	0	0	0	9	1
Telephone communications.....	481	59	1	0	0	0	0	0	0	51	0	0	0	8	1
Other communications.....	482-484,489	31	6	24	4	2	1	4	1	0	0	0	0	1	0
Electric, gas, and sanitary services....	49	161	56	77	49	2	0	57	4	14	1	9	2	2	0
Other transportation and utilities.....	40-42,44-47	166	54	103	51	1	0	4	1	2	1	1	0	55	1
Trade.....	50-59	3,713	972	3,567	938	14	1	73	15	20	5	30	12	10	1
Finance, insurance, and real estate.....	60-65,67	382	68	309	55	31	3	23	9	9	0	3	0	7	1
Services.....	701,72,73,75-81, 83,84,87,89	4,891	819	4,482	755	182	25	179	33	20	3	17	2	11	0
Business services.....	73	2,455	238	2,276	217	84	8	65	11	14	2	5	0	10	0
Computer and data processing services.....	737	2,273	228	2,144	214	63	6	51	7	10	2	3	0	3	0
Other business services.....	731-736,738	181	9	133	3	22	2	14	4	4	0	2	0	7	0

See explanatory information and SOURCE at end of table.

Table A-32. Number of companies conducting industrial basic research and total number of R&D-performing companies, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Size of company													
		Total		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees		25,000 or more employees	
		Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic	Total	Basic
Health services.....	80	483	109	456	104	3	1	21	3	0	0	3	1	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	427	107	404	103	3	1	17	2	0	0	3	1	0	0
Other health services.....	802-805,808-809	56	2	52	1	0	0	4	1	0	0	0	0	0	0
Engineering and management services.....	87	1,569	402	1,495	383	42	15	23	3	3	1	5	1	1	0
Engineering, architectural, and surveying.....	871	697	150	661	145	14	2	18	2	1	1	3	0	0	0
Research, development, and testing.....	873	727	246	711	238	13	7	2	1	0	0	0	0	1	0
Other engineering and management services.....	872,874	145	7	123	0	15	6	3	0	2	0	2	1	0	0
Other services.....	701,72,75-79,81, 83,84,89	385	70	255	52	53	2	70	16	3	0	4	0	0	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	7,579	1,542	7,535	1,535	8	0	24	6	9	1	1	0	1	0

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-33. Funds for industrial applied R&D performance, by product field and source of funds: 1997

Page 1 of 2

Product field	SIC code	Total	Federal	Company
		[Dollars in millions]		
Total.....		60,858	4,114	56,744
Food and kindred products.....	20	763	(D)	(D)
Textile mill products.....	22	267 (S)	(D)	(D)
Chemicals and allied products.....	28	9,821	26	9,794
Industrial inorganic and organic chemicals.....	281,286	654	4	650
Plastics materials and synthetic resins, rubber, and fibers.....	282	1,092	(D)	(D)
Drugs and medicines.....	283	6,575	6	6,569
Agricultural chemicals.....	287	562	0	562
Other chemicals.....	284-85,289	937	(D)	(D)
Petroleum refining.....	29	679	(D)	(D)
Rubber and miscellaneous plastics products.....	30	337	(D)	(D)
Stone, clay, and glass products.....	32	117	5	112
Primary metals.....	33	217	8	210
Ferrous metals and products.....	331-32,3398-99	117	(D)	(D)
Nonferrous metals and products.....	333-36	100	(D)	(D)
Fabricated metal products.....	34	455	128	327
Ordnance and accessories, n.e.c.....	348	31	(D)	(D)
Other fabricated metal products.....	341-47,349	424	(D)	(D)
Machinery.....	35	7,894	513	7,381
Engines and turbines.....	351	1,538	(D)	(D)
Farm machinery and equipment.....	352	320	311	311
Construction, mining, and materials handling machinery.....	353	420	(D)	(D)
Metalworking machinery and equipment.....	354	128	(D)	(D)
Office, computing, and accounting machines.....	357	4,835	(D)	(D)
Other machinery, except electrical.....	355-56,358-59	651	(D)	(D)
Electrical equipment.....	36	14,826	771	14,055
Electric transmission and distribution equipment.....	361,3825	223	(D)	(D)
Electrical industrial apparatus.....	362	253	(D)	(D)
Radio and TV receiving equipment.....	365	219	(D)	(D)
Communication equipment.....	366	5,569	307	5,262
Electronic components.....	367	7,763	361	7,403
Other electrical equipment and supplies.....	363-64,368-69	798	2	796
Transportation equipment.....	37	10,295	1,130	9,165
Motor vehicles and equipment.....	371	7,901	(D)	(D)
Other transportation equipment.....	373-75,379	135	(D)	(D)
Aircraft and parts.....	372	1,551	(D)	(D)
Guided missiles and spacecraft.....	376	708	606	102
Professional and scientific instruments.....	38, except 3825	2,426	357	2,069
Scientific and mechanical measuring instruments.....	381-82	1,491	(D)	(D)
Optical, surgical, photographic, and other instruments.....	383-87	935	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-33. Funds for industrial applied R&D performance, by product field and source of funds: 1997

Page 2 of 2

Product field	SIC code	Total	Federal	Company
		[Dollars in millions]		
Lumber and wood products.....	24	28	0	28
Paper and allied products.....	26	305	(D)	(D)
Leather.....	31	36	0	36
Software.....	737	6,330	159	6,171
Other product fields, n.e.c.	-	6,063	978	5,085

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

Other product fields, n.e.c. = Not elsewhere classified.

NOTE: Imputation of R&D expenditures by product field was eliminated beginning in 1985. This table, therefore, contains only applied research and development data reported by survey respondents who received Form RD-1L. See Table A-34 for coverage ratios showing the percentage of each industry's applied research and development funds that respondents distributed by product field.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997

Page 1 of 6

Industry and size of company	SIC code	Coverage ratio	Applied R&D Total	Food and kindred products	Textile mill products	Paper and allied products	Chemicals	Petroleum refining and oil and gas extraction	Rubber products
				20	22	26		29, 13	30
[Dollars in millions]									
All Industries.....		0.62	60,858	763	267 (S)	305	9,821	679	337
Distribution by industry:									
Manufacturing.....		0.71	12,139	670	262 (S)	300	8,105	487	(D)
Food, kindred, and tobacco products.....	20,21	0.53	543	543	(D)	(D)	(D)	0	0
Textiles and apparel.....	22,23	0.70	102	(D)	81	0	8	0	0
Lumber, wood products, and furniture.....	24,25	0.34	0	0	0	0	0	0	0
Paper and allied products.....	26	0.55	171	0	(D)	159	(D)	0	12
Chemicals and allied products.....	28	0.69	7,597	116	(D)	(D)	7,481	(D)	(D)
Industrial chemicals.....	281-82,286	0.73	0 (S)	(D)	(D)	(D)	(D)	(D)	(D)
Drugs and medicines.....	283	0.67	0	(D)	(D)	0	(D)	0	0
Other chemicals.....	284-85,287-89	0.69	5	(D)	(D)	(D)	(D)	0	0
Petroleum refining and extraction.....	13,29	0.96	425	0	(D)	0	(D)	425	(D)
Rubber products.....	30	0.46	273	0	3	(D)	(D)	(D)	255
Stone, clay, and glass products.....	32	0.91	82	0	0	(D)	(D)	0	0
Primary metals.....	33	0.74	200	0	0	0	(D)	(D)	(D)
Ferrous metals and products.....	331-32,3398-99	0.86	0	0	0	0	(D)	(D)	0
Nonferrous metals and products.....	333-36	0.42	17	0	0	0	(D)	0	(D)
Fabricated metal products.....	34	0.66	136	0	(D)	0	(D)	0	12
Machinery.....	35	0.78	4,878	0	0	0	(D)	(D)	(D)
Office, computing, and accounting machines.....	357	0.80	0	0	0	0	0	0	0
Other machinery, except electrical.....	351-56,358-59	0.75	56	0	0	0	(D)	(D)	(D)
Electrical equipment.....	36	0.65	60	0	0	0	(D)	0	(D)
Radio and TV receiving equipment.....	365	0.49	0	0	0	0	(D)	0	0
Communication equipment.....	366	0.63	0	0	0	0	(D)	0	0
Electronic components.....	367	0.69	0	0	0	0	(D)	0	(D)
Other electrical equipment.....	361-64,369	0.63	770	0	0	0	(D)	0	(D)

See explanatory information and SOURCE at end of table.

Table A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997

Page 2 of 6

Industry and size of company	SIC code	Coverage ratio	Applied R&D Total	Food and kindred products	Textile mill products	Paper and allied products	Chemicals	Petroleum refining and oil and gas extraction	Rubber products
				20	22	26		29, 13	30
[Dollars in millions]									
Distribution by industry:									
Transportation equipment.....	37	0.85	0	(D)	(D)	0	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	0	0	(D)	0	0
Other transportation equipment.....	373-75,379	0.80	(D)	(D)	0	0	0	0	0
Aircraft and missiles.....	372,376	0.29	0	0	(D)	0	(D)	(D)	(D)
Professional and scientific instruments.....	38	0.60	2,553	0	(D)	0	(D)	(D)	(D)
Scientific and mechanical measuring instruments.....	381-82	1.12	0 (S)	0	0	0	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	0.24	0	0	(D)	0	(D)	0	(D)
Other manufacturing industries ¹	27,31,39	0.12	21	0	(D)	17	(D)	0	(D)
Nonmanufacturing.....		0.37	2,124	94	6	5	1,716	192	(D)
Transportation and utilities.....	40-42,44-49	0.25	304	0	(D)	0	(D)	0	(D)
Communications.....	48	0.24	0	0	0	0	0	0	0
Telephone communications.....	481	0.24	(D)	0	0	0	0	0	0
Other communications.....	482-484,489	0.23	(D)	0	0	0	0	0	0
Electric, gas, and sanitary services.....	49	0.79	113	0	0	0	(D)	0	0
Other transportation and utilities.....	40-42,44-47	0.04	0	0	(D)	0	(D)	0	(D)
Trade.....	50-59	0.30	442	10	2	(D)	(D)	(D)	0
Finance, insurance, and real estate.....	60-65,67	0.29	294	1	0	0	(D)	0	0
Services.....	701,72,73,75-81, 83,84,87,89	0.44	88	(D)	(D)	(D)	(D)	(D)	0
Business services.....	73	0.45	4,458	0	0	0	(D)	0	0
Computer and data processing services.....	737	0.44	0	0	0	0	(D)	0	0
Other business services.....	731-736,738	0.70	0	0	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997

Page 3 of 6

Industry and size of company	SIC code	Coverage ratio	Applied R&D Total	Food and kindred products	Textile mill products	Paper and allied products	Chemicals	Petroleum refining and oil and gas extraction	Rubber products
				20	22	26		29, 13	30
[Dollars in millions]									
Distribution by industry:									
Health services.....	80	(D)	22	0	0	0	(D)	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	(D)	0	0	0	(D)	0	0
Other health services.....	802-805,808-809	0.63	(D)	0	0	0	(D)	0	0
Engineering and management services.....	87	0.45	63	(D)	(D)	(D)	(D)	(D)	0
Engineering, architectural, and surveying	871	0.38	195	0	0	0	(D)	(D)	0
Research, development, and testing.....	873	0.50	0	(D)	(D)	(D)	(D)	(D)	0
Other engineering and management services	872,874	0.08	17	0	0	0	(D)	0	0
Other services.....	701,72,75-79,81, 83,84,89	0.24	0	0	0	0	0	0	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	0.16	20	(D)	0	0	(D)	(D)	0
Distribution by size of company: [Number of employees]									
Total.....		1.00	60,859	763	267 (S)	305	9,821	679	337
Fewer than 500.....		0.20	278	(D)	12	7	(D)	(D)	7
500 to 999.....		0.57	477	8	11	(D)	240	(D)	15
1,000 to 4,999.....		0.64	5,268	74	50	79	(D)	72	109
5,000 to 9,999.....		0.68	308	200	10	16	(D)	0	27
10,000 to 24,999.....		0.69	589	151	(D)	50	(D)	328	(D)
25,000 or more.....		0.77	241	(D)	(D)	(D)	(D)	241	(D)

See explanatory information and SOURCE at end of table.

Table A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997

Page 4 of 6

Industry	SIC code	Stone, clay and glass products	Primary metals	Fabricated metal products	Machinery	Electrical equipment	Transportation equipment	Professional and scientific instruments	Other product fields n.e.c.
		32	33	34	35	36	37	38	...
[Dollars in millions]									
All Industries.....		117	217	455	7,894	14,826	10,295	2,426	12,457
Distribution by industry:									
Manufacturing.....		(D)	(D)	(D)	(D)	(D)	(D)	2,315	(D)
Food, kindred, and tobacco products.....	20,21	0	0	0	(D)	(D)	0	0	(D)
Textiles and apparel.....	22,23	0	0	0	0	(D)	(D)	0	13
Lumber, wood products, and furniture.....	24,25	0	0	0	0	(D)	(D)	(D)	(D)
Paper and allied products.....	26	(D)	(D)	(D)	(D)	0	0	(D)	(D)
Chemicals and allied products.....	28	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Industrial chemicals.....	281-82,286	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Drugs and medicines.....	283	0	0	0	(D)	(D)	0	(D)	(D)
Other chemicals.....	284-85,287-89	0	0	0	5	(D)	0	0	(D)
Petroleum refining and extraction.....	13,29	0	0	0	0	0	0	0	(D)
Rubber products.....	30	(D)	(D)	15	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products.....	32	82	0	0	(D)	(D)	(D)	(D)	(D)
Primary metals.....	33	0	161	32	(D)	(D)	(D)	0	7
Ferrous metals and products.....	331-32,3398-99	0	(D)	(D)	(D)	(D)	(D)	0	(D)
Nonferrous metals and products.....	333-36	0	(D)	(D)	(D)	(D)	17 (S)	0	(D)
Fabricated metal products.....	34	(D)	16	108	(D)	(D)	(D)	(D)	(D)
Machinery.....	35	(D)	(D)	56	4,822	(D)	(D)	(D)	(D)
Office, computing, and accounting machines	357	0	0	0	(D)	(D)	0	0	(D)
Other machinery, except electrical.....	351-56,358-59	(D)	(D)	56	(D)	(D)	(D)	(D)	(D)
Electrical equipment.....	36	(D)	(D)	(D)	(D)	(D)	(D)	60	(D)
Radio and TV receiving equipment.....	365	0	0	(D)	0	(D)	0	0	0
Communication equipment.....	366	0	0	0	0	(D)	(D)	(D)	(D)
Electronic components.....	367	0	(D)	0	(D)	(D)	(D)	(D)	(D)
Other electrical equipment.....	361-64,369	(D)	(D)	(D)	(D)	770	(D)	(D)	(D)
Transportation equipment.....	37	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment.....	371	0	0	(D)	(D)	(D)	(D)	0	(D)

See explanatory information and SOURCE at end of table.

Table A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997

Page 5 of 6

Industry	SIC code	Stone, clay and glass products 32	Primary metals 33	Fabricated metal products 34	Machinery 35	Electrical equipment 36	Transportation equipment 37	Professional and scientific instruments 38	Other product fields n.e.c. ...
		[Dollars in millions]							
Distribution by industry:									
Other transportation equipment.....	373-75,379	0	0	0	0	0	(D)	0	0
Aircraft and missiles.....	372,376	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments.....	38	0	(D)	(D)	84	(D)	(D)	1,788	681
Scientific and mechanical measuring instruments	381-82	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	0	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other manufacturing industries ¹	27,31,39	0	(D)	4	(D)	(D)	0	0	(D)
Nonmanufacturing.....		(D)	(D)	(D)	(D)	(D)	(D)	111	(D)
Transportation and utilities.....	40-42,44-49	0	(D)	0	(D)	(D)	(D)	(D)	304
Communications.....	48	0	0	0	0	(D)	0	0	(D)
Telephone communications.....	481	0	0	0	0	(D)	0	0	(D)
Other communications.....	482-484,489	0	0	0	0	(D)	0	0	(D)
Electric, gas, and sanitary services.....	49	0	(D)	0	(D)	(D)	(D)	(D)	113
Other transportation and utilities.....	40-42,44-47	0	0	0	0	0	(D)	0	(D)
Trade.....	50-59	0	0	0	(D)	(D)	(D)	(D)	430
Finance, insurance, and real estate.....	60-65,67	0	0	0	0	(D)	0	0	293
Services.....	701,72,73,75-81, 83,84,87,89	0	(D)	(D)	(D)	(D)	(D)	88	(D)
Business services.....	73	0	0	0	(D)	(D)	(D)	(D)	4,458
Computer and data processing services	737	0	0	0	(D)	(D)	(D)	(D)	(D)
Other business services.....	731-736,738	0	0	0	(D)	(D)	0	(D)	(D)
Health services.....	80	0	0	0	0	0	0	(D)	22
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801, 806,807	0	0	0	0	0	0	(D)	22
Other health services.....	802-805,808-809	0	0	0	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-34. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and product field: 1997

Page 6 of 6

Industry	SIC code	Stone, clay and glass products 32	Primary metals 33	Fabricated metal products 34	Machinery 35	Electrical equipment 36	Transportation equipment 37	Professional and scientific instruments 38	Other product fields n.e.c. ...
		[Dollars in millions]							
Distribution by industry:									
Engineering and management services.....	87	0	(D)	(D)	(D)	(D)	(D)	63	(D)
Engineering, architectural, and surveying	871	0	0	(D)	(D)	(D)	(D)	(D)	195
Research, development, and testing.....	873	0	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other engineering and management services	872,874	0	0	0	(D)	0	0	0	17
Other services.....	701,72,75-79,81, 83,84,89	0	0	0	(D)	(D)	0	(D)	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	(D)	(D)	0	20	0	0	0	(D)
Distribution by size of company: [Number of employees]									
Total.....		117	217	455	7,894	14,826	10,295	2,426	12,457
Fewer than 500.....		8	16	(D)	(D)	(D)	(D)	228	(D)
500 to 999.....		8	(D)	22	(D)	(D)	(D)	173	(D)
1,000 to 4,999.....		22	54	110	954	(D)	(D)	744	3,000
5,000 to 9,999.....		(D)	55	(D)	(D)	(D)	(D)	(D)	(D)
10,000 to 24,999.....		(D)	60	(D)	(D)	(D)	(D)	(D)	(D)
25,000 or more.....		(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

Other product fields n.e.c. = Products not elsewhere classified. Includes Lumber and Wood Products (SIC 24) and Leather (SIC 31) and Software (SIC 737).

NOTE: Imputation of R&D expenditures by product field was eliminated beginning in 1985. This table, therefore, contains only data reported by survey respondents who received Form RD-1L.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 1 of 12

Industry and size of company	SIC code	Chemicals					Primary metals		Fabricated metals		Computer programming, data processing, and other computer related services 737
		Industrial inorganic and organic chemicals 281,286	Plastics, synthetic resins, rubber, and fibers 282	Drugs and medicines 283	Agricultural chemicals 287	Other chemicals 284-85, 289	Ferrous metals and products 331-32 3398-99	Nonferrous metal and products 333-36	Other fabricated metal products 341-47,349	Ordnance and accessories n.e.c. 348	
[Dollars in millions]											
Total.....		654	1,092	6,575	562	937	117	100	424	31	6,330
Distribution by industry:											
Manufacturing.....		499	1,060	5,073	556	917	(D)	(D)	(D)	(D)	1,977
Food, kindred, and tobacco products.....	20,21	(D)	(D)	(D)	(D)	0	0	0	0	0	0
Textiles and apparel.....	22,23	0	8	0	0	0	0	0	0	0	0
Lumber, wood products, and furniture.....	24,25	0	0	0	0	0	0	0	0	0	0
Paper and allied products.....	26	10	(D)	0	0	(D)	0	(D)	(D)	0	0
Chemicals and allied products.....	28	390	704	5,066	553	768	0	(D)	0	(D)	(D)
Industrial chemicals.....	281-82,286	291	687	(D)	482	(D)	0	(D)	0	(D)	0
Drugs and medicines.....	283	(D)	(D)	4,483	(D)	(D)	0	0	0	0	0
Other chemicals.....	284-85,287-89	(D)	(D)	(D)	(D)	625	0	0	0	0	(D)
Petroleum refining and extraction.....	13,29	(D)	125	0	0	(D)	0	0	0	0	0
Rubber products.....	30	(D)	65	(D)	0	(D)	0	(D)	15	0	0
Stone, clay, and glass products.....	32	(D)	(D)	0	0	(D)	0	0	0	0	(D)
Primary metals.....	33	(D)	(D)	0	0	0	101	61	32	0	0
Ferrous metals and products.....	331-32, 3398-99	0	(D)	0	0	0	(D)	(D)	(D)	0	0
Nonferrous metals and products.....	333-36	(D)	(D)	0	0	0	(D)	(D)	(D)	0	0
Fabricated metal products.....	34	(D)	15	0	0	(D)	10	6	99	9	0
Machinery.....	35	(D)	0	0	0	(D)	(D)	(D)	56	0	(D)
Office, computing, and accounting machines	357	0	0	0	0	0	(D)	(D)	0	0	(D)
Other machinery, except electrical.....	351-56,358-59	(D)	0	0	0	(D)	(D)	(D)	56	0	5

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 2 of 12

Industry and size of company	SIC code	Chemicals					Primary metals		Fabricated metals		Computer programming, data processing, and other computer related services 737
		Industrial inorganic and organic chemicals 281,286	Plastics, synthetic resins, rubber, and fibers 282	Drugs and medicines 283	Agricultural chemicals 287	Other chemicals 284-85, 289	Ferrous metals and products 331-32	Nonferrous metal and products 3398-99	Other fabricated metal products 341-47,349	Ordnance and accessories n.e.c. 348	
		[Dollars in millions]									
Distribution by industry:											
Electrical equipment.....	36	6	(D)	(D)	0	(D)	(D)	(D)	(D)	0	220
Radio and TV receiving equipment.....	365	0	(D)	0	0	0	0	0	(D)	0	0
Communication equipment.....	366	(D)	0	0	0	0	0	0	0	0	(D)
Electronic components.....	367	0	0	(D)	0	0	(D)	(D)	0	0	(D)
Other electrical equipment.....	361-64,369	(D)	(D)	0	0	(D)	(D)	(D)	(D)	0	(D)
Transportation equipment.....	37	(D)	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	0	0	(D)	0	0	(D)	(D)	(D)
Other transportation equipment.....	373-75,379	0	0	0	0	0	0	0	0	0	0
Aircraft and missiles.....	372,376	0	(D)	0	0	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments.....	38	(D)	(D)	(D)	0	0	0	(D)	(D)	(D)	35
Scientific and mechanical measuring instruments	381-82	(D)	(D)	0	0	0	0	0	(D)	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	0	(D)	(D)	0	0	0	(D)	(D)	0	(D)
Other manufacturing industries ¹	27,31,39	0	(D)	0	(D)	0	0	(D)	4	0	(D)
Nonmanufacturing	155	32	1,502	6	20	(D)	(D)	(D)	(D)	(D)	4,353
Transportation and utilities.....	40-42,44-49	(D)	(D)	0	0	0	(D)	0	0	0	85
Communications.....	48	0	0	0	0	0	0	0	0	0	(D)
Telephone communications.....	481	0	0	0	0	0	0	0	0	0	(D)
Other communications.....	482-484,489	0	0	0	0	0	0	0	0	0	(D)
Electric, gas, and sanitary services.....	49	(D)	(D)	0	0	0	(D)	0	0	0	0
Other transportation and utilities.....	40-42,44-47	(D)	(D)	0	0	0	0	0	0	0	(D)

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 3 of 12

Industry and size of company	SIC code	Chemicals					Primary metals		Fabricated metals		Computer programming, data processing, and other computer related services 737
		Industrial inorganic and organic chemicals 281,286	Plastics, synthetic resins, rubber, and fibers 282	Drugs and medicines 283	Agricultural chemicals 287	Other chemicals 284-85, 289	Ferrous metals and products 331-32 3398-99	Nonferrous metal and products 333-36	Other fabricated metal products 341-47,349	Ordnance and accessories n.e.c. 348	
[Dollars in millions]											
Distribution by industry:											
Trade.....	50-59	(D)	(D)	174	1	(D)	0	0	0	0	(D)
Finance, insurance, and real estate.....	60-65,67	0	1	0	0	0	0	0	0	0	278
Services.....	701,72,73,75- 81,83,84,87,89	(D)	(D)	1,327	(D)	(D)	0	(D)	(D)	(D)	3,914
Business services.....	73	(D)	0	0	0	0	0	0	0	0	3,802
Computer and data processing services	737	(D)	0	0	0	0	0	0	0	0	3,778
Other business services.....	731-736,738	0	0	0	0	0	0	0	0	0	24
Health services.....	80	0	0	(D)	(D)	0	0	0	0	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	0	0	(D)	(D)	0	0	0	0	0	0
Other health services.....	802-805, 808-809	0	0	(D)	(D)	0	0	0	0	0	0
Engineering and management services	87	9	(D)	1,290	(D)	(D)	0	(D)	(D)	(D)	103
Engineering, architectural, and surveying	871	0	0	(D)	0	0	0	0	(D)	(D)	49
Research, development, and testing	873	9	(D)	(D)	(D)	(D)	0	(D)	0	(D)	37
Other engineering and management services.....	872,874	0	0	(D)	0	0	0	0	0	0	17
Other services.....	701,72,75-79, 81,83,84,89	0	0	0	0	0	0	0	0	0	10
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	(D)	0	0	0	(D)	0	(D)	0	0	(D)

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 4 of 12

Industry and size of company	SIC code	Chemicals					Primary metals		Fabricated metals		Computer programming, data processing, and other computer related services 737
		Industrial inorganic and organic chemicals 281,286	Plastics, synthetic resins, rubber, and fibers 282	Drugs and medicines 283	Agricultural chemicals 287	Other chemicals 284-85, 331-32 3398-99	Ferrous metals and products 331-32	Nonferrous metal and products 333-36	Other fabricated metal products 341-47,349	Ordnance and accessories n.e.c. 348	
[Dollars in millions]											
Distribution by size of company: [Number of employees]											
Total.....		654	1,092	6,575	562	937	117	100	424	31	6,330
Fewer than 500.....		(D)	(D)	1,219	(D)	5	(D)	(D)	(D)	(D)	786
500 to 999.....		28	13	186	1	12	0	(D)	15	7	382
1,000 to 4,999.....		310	(D)	1,966	(D)	148	21	32	92	18	1,936
5,000 to 9,999.....		109	(D)	1,307	(D)	289	24	31	47	(D)	408
10,000 to 24,999.....		115	319	(D)	(D)	(D)	44	15	(D)	(D)	855
25,000 or more.....		(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	1,963

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 5 of 12

Industry	SIC code	Machinery						Electrical equipment			
		Engines and turbines 351	Farm machinery and equipment 352	Construction mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communication types 365	Communications equipment 366
		[Dollars in millions]									
All Industries.....		1,538	320	420	128	4,835	651	223	253	219	5,569
Distribution by industry:											
Manufacturing.....		1,531	(D)	397	(D)	3,524	645	(D)	(D)	219	4,912
Food, kindred, and tobacco products.....	20,21	0	0	0	0	0	(D)	0	(D)	0	0
Textiles and apparel.....	22,23	0	0	0	0	0	0	0	0	0	0
Lumber, wood products, and furniture.....	24,25	0	0	0	0	0	0	0	(D)	0	0
Paper and allied products.....	26	0	0	0	0	(D)	0	0	0	0	0
Chemicals and allied products.....	28	0	0	5	0	(D)	(D)	0	(D)	0	0
Industrial chemicals.....	281-82,286	0	0	0	0	0	(D)	0	0	0	0
Drugs and medicines.....	283	0	0	0	0	(D)	0	0	(D)	0	0
Other chemicals.....	284-85,287-89	0	0	5	0	0	0	0	0	0	0
Petroleum refining and extraction.....	13,29	0	0	0	0	0	0	0	0	0	0
Rubber products.....	30	0	0	0	0	0	(D)	0	0	0	0
Stone, clay, and glass products.....	32	0	0	(D)	0	0	0	0	0	0	(D)
Primary metals.....	33	0	(D)	(D)	0	0	(D)	(D)	(D)	0	(D)
Ferrous metals and products.....	331-32, 3398-99	0	(D)	(D)	0	0	(D)	0	(D)	0	0
Nonferrous metals and products.....	333-36	0	(D)	(D)	0	0	0	(D)	0	0	(D)
Fabricated metal products.....	34	0	(D)	(D)	13	(D)	24	0	0	0	(D)
Machinery.....	35	381	309	379	111	3,176	466	(D)	(D)	(D)	(D)
Office, computing, and accounting machines.....	357	0	0	0	0	(D)	(D)	0	0	0	(D)
Other machinery, except electrical.....	351-56,358-59	381	309	379	111	(D)	(D)	(D)	(D)	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 6 of 12

Industry	SIC code	Machinery						Electrical equipment			
		Engines and turbines 351	Farm machinery and equipment 352	Construction mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communication types 365	
		[Dollars in millions]									
Distribution by industry:											
Electrical equipment.....	36	(D)	0	0	0	(D)	(D)	180	(D)	(D)	3,894
Radio and TV receiving equipment.....	365	0	0	0	0	0	0	0	(D)	(D)	0
Communication equipment.....	366	0	0	0	0	0	0	(D)	0	(D)	3,749
Electronic components.....	367	(D)	0	0	0	(D)	0	(D)	(D)	(D)	104
Other electrical equipment.....	361-64,369	(D)	0	0	0	0	(D)	156	110	0	41
Transportation equipment.....	37	(D)	0	0	(D)	(D)	11	(D)	(D)	0	(D)
Motor vehicles and motor vehicles equipment.....	371	(D)	0	0	0	0	(D)	0	0	0	0
Other transportation equipment.....	373-75,379	0	0	0	0	0	0	0	0	0	0
Aircraft and missiles.....	372,376	(D)	0	0	(D)	(D)	(D)	(D)	(D)	0	(D)
Professional and scientific instruments.....	38	0	0	0	0	0	84	(D)	44	(D)	93
Scientific and mechanical measuring instruments.....	381-82	0	0	0	0	0	(D)	4	(D)	(D)	93
Optical, surgical, photographic, and other instruments.....	384-87	0	0	0	0	0	(D)	(D)	(D)	0	0
Other manufacturing industries ¹	27,31,39	0	0	0	(D)	(D)	(D)	0	(D)	0	(D)
Nonmanufacturing.....	7	(D)	23	(D)	1,311	7	(D)	(D)	(D)	0	657
Transportation and utilities.....	40-42,44-49	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	0	324
Communications.....	48	0	0	0	0	0	0	0	0	0	324
Telephone communications.....	481	0	0	0	0	0	0	0	0	0	(D)
Other communications.....	482-484,489	0	0	0	0	0	0	0	0	0	(D)
Electric, gas, and sanitary services.....	49	(D)	0	(D)	(D)	(D)	(D)	(D)	(D)	0	0
Other transportation and utilities.....	40-42,44-47	0	0	0	0	0	0	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 7 of 12

Industry	SIC code	Machinery						Electrical equipment			
		Engines and turbines 351	Farm machinery and equipment 352	Construction mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communication types 365	Communications equipment 366
		[Dollars in millions]									
Distribution by industry:											
Trade.....	50-59	(D)	(D)	0	0	(D)	0	0	0	0	(D)
Finance, insurance, and real estate.....	60-65,67	0	0	0	0	0	0	0	0	0	(D)
Services.....	701,72,73,75- 81,83,84,87,89	7	(D)	(D)	2	132	(D)	(D)	0	0	100
Business services.....	73	0	0	0	(D)	(D)	0	(D)	0	0	38
Computer and data processing services	737	0	0	0	(D)	(D)	0	0	0	0	(D)
Other business services.....	731-736,738	0	0	0	(D)	(D)	0	(D)	0	0	(D)
Health services.....	80	0	0	0	0	0	0	0	0	0	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	0	0	0	0	0	0	0	0	0	0
Other health services.....	802-805, 808-809	0	0	0	0	0	0	0	0	0	0
Engineering and management services	87	7	(D)	(D)	(D)	50	(D)	(D)	0	0	62
Engineering, architectural, and surveying	871	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	0	30
Research, development, and testing.....	873	(D)	0	0	0	(D)	(D)	0	0	0	32
Other engineering and management services.....	872,874	0	0	0	0	(D)	(D)	0	0	0	0
Other services.....	701,72,75-79, 81,83,84,89	0	0	0	0	(D)	(D)	0	0	0	0

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 8 of 12

Industry	SIC code	Machinery						Electrical equipment			Communications equipment 366
		Engines and turbines 351	Farm machinery and equipment 352	Construction mining, and materials handling machinery 353	Metal-working machinery and equipment 354	Office computing and accounting machines 357	Other machinery except electrical 355-56	Electric transmission and distribution equipment 361	Electrical industrial apparatus 362	Radio and television receiving sets except communication types 365	
		[Dollars in millions]									
Distribution by industry:											
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	0	0	20	0	0	0	0	0	0	0
Distribution by size of company: [Number of employees]											
Total.....		1,538	320	420	128	4,835	651	223	253	219	5,569
Fewer than 500.....		5	(D)	(D)	17	99	38	(D)	(D)	10	243
500 to 999.....		(D)	(D)	25	21	36	157	(D)	(D)	(D)	(D)
1,000 to 4,999.....		14	69	70	61	442	298	47	(D)	(D)	669
5,000 to 9,999.....		64	(D)	39	(D)	893	(D)	(D)	7	(D)	752
10,000 to 24,999.....		(D)	(D)	(D)	(D)	(D)	124	129	29	(D)	(D)
25,000 or more.....		1,368	(D)	(D)	0	(D)	(D)	(D)	116	(D)	3,639

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 9 of 12

Industry	SIC code	Electrical equipment		Transportation equipment			Professional and scientific instruments		
		Electronic components and accessories	Other electrical equipment and supplies 363-64, 368-69	Motor vehicles and equipment	Other transportation equipment	Aircraft and parts	Guided missiles and spacecraft	Scientific and mechanical measuring instruments	
		367	371	379	372	376	381-82	383-87	
[Dollars in millions]									
All Industries.....		7,763	798	7,901	135	1,551	708	1,491	935
Distribution by industry:									
Manufacturing.....		7,527	778	7,509	(D)	1,536	(D)	1,451	864
Food, kindred, and tobacco products.....	20,21	0	0	0	0	0	0	0	0
Textiles and apparel.....	22,23	0	(D)	(D)	0	0	0	0	0
Lumber, wood products, and furniture.....	24,25	(D)	0	(D)	0	(D)	0	(D)	0
Paper and allied products.....	26	0	0	0	0	0	0	(D)	(D)
Chemicals and allied products.....	28	117	(D)	(D)	0	0	0	(D)	(D)
Industrial chemicals.....	281-82,286	(D)	(D)	(D)	0	0	0	0	(D)
Drugs and medicines.....	283	0	(D)	0	0	0	0	(D)	315
Other chemicals.....	284-85,287-89	(D)	0	0	0	0	0	(D)	0
Petroleum refining and extraction.....	13,29	0	0	0	0	0	0	0	0
Rubber products.....	30	(D)	(D)	13	(D)	(D)	0	(D)	0
Stone, clay, and glass products.....	32	(D)	0	40	(D)	(D)	0	(D)	0
Primary metals.....	33	(D)	(D)	19	(D)	(D)	0	0	0
Ferrous metals and products.....	331-32,3398-99	(D)	(D)	(D)	0	(D)	0	0	0
Nonferrous metals and products.....	333-36	(D)	0	(D)	0	0	0	0	0
Fabricated metal products.....	34	(D)	(D)	5	(D)	(D)	(D)	(D)	0
Machinery.....	35	1,262	250	149	(D)	(D)	0	(D)	(D)
Office, computing, and accounting machines	357	1,221	(D)	0	0	0	0	0	0
Other machinery, except electrical.....	351-56,358-59	40	(D)	149	(D)	(D)	0	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 10 of 12

Industry	SIC code	Electrical equipment		Transportation equipment				Professional and scientific instruments		
		Electronic components and accessories	Other electrical equipment and supplies	Motor vehicles and equipment	Other transportation equipment	Aircraft and parts	Guided missiles and spacecraft	Scientific and mechanical measuring instruments	Optical, surgical photographic and other instruments	
		367	363-64, 368-69	371	379	372	376	381-82	383-87	
[Dollars in millions]										
Distribution by industry:										
Electrical equipment.....	36	3,228	336	25	10	(D)	(D)	37	24	
Radio and TV receiving equipment.....	365	(D)	0	0	0	0	0	(D)	0	
Communication equipment.....	366	(D)	(D)	0	(D)	0	0	(D)	0	
Electronic components.....	367	2,625	(D)	(D)	0	0	0	(D)	(D)	
Other electrical equipment.....	361-64,369	198	265	(D)	(D)	(D)	(D)	(D)	(D)	
Transportation equipment.....	37	(D)	0	(D)	27	(D)	(D)	(D)	0	
Motor vehicles and motor vehicles equipment	371	(D)	0	(D)	0	0	(D)	0	0	
Other transportation equipment.....	373-75,379	0	0	(D)	(D)	0	0	0	0	
Aircraft and missiles.....	372,376	(D)	0	(D)	(D)	(D)	123	(D)	0	
Professional and scientific instruments.....	38	2,370	126	(D)	(D)	(D)	(D)	1,270	517	
Scientific and mechanical measuring instruments	381-82	(D)	113	(D)	(D)	14	(D)	(D)	(D)	
Optical, surgical, photographic, and other instruments.....	384-87	(D)	13	0	0	(D)	0	(D)	(D)	
Other manufacturing industries ¹	27,31,39	11 (S)	9	0	0	0	0	0	0	
Nonmanufacturing.....		236	21	393	(D)	15	89	39	72	
Transportation and utilities.....	40-42,44-49	(D)	(D)	(D)	(D)	(D)	0	(D)	(D)	
Communications.....	48	0	0	0	0	0	0	0	0	
Telephone communications.....	481	0	0	0	0	0	0	0	0	
Other communications.....	482-484,489	0	0	0	0	0	0	0	0	
Electric, gas, and sanitary services.....	49	(D)	(D)	0	(D)	(D)	0	(D)	(D)	
Other transportation and utilities.....	40-42,44-47	0	0	(D)	(D)	(D)	0	0	0	

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 11 of 12

Industry	SIC code	Electrical equipment		Transportation equipment			Professional and scientific instruments		
		Electronic components and accessories	Other electrical equipment and supplies	Motor vehicles and equipment	Other transportation equipment	Aircraft and parts	Guided missiles and spacecraft	Scientific and mechanical measuring instruments	
		367	363-64, 368-69	371	379	372	376	381-82	
[Dollars in millions]									
Distribution by industry:									
Trade.....	50-59	(D)	0	0	(D)	(D)	0	(D)	
Finance, insurance, and real estate.....	60-65,67	0	0	0	0	0	0	0	
Services.....	701,72,73,75-81, 83,84,87,89	127	(D)	391	(D)	(D)	89	29	
Business services.....	73	(D)	(D)	0	0	(D)	0	(D)	
Computer and data processing services	737	36	(D)	0	0	(D)	0	(D)	
Other business services.....	731-736 738	(D)	(D)	0	0	0	0	(D)	
Health services.....	80	0	0	0	0	0	0	(D)	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	0	0	0	0	0	0	(D)	
Other health services.....	802-805, 808-809	0	0	0	0	0	0	0	
Engineering and management services.....	87	70	(D)	391	(D)	14	(D)	28	
Engineering, architectural, and surveying	871	(D)	(D)	21	(D)	(D)	(D)	(D)	
Research, development, and testing.....	873	(D)	(D)	370	(D)	(D)	(D)	(D)	
Other engineering and management services	872,874	0	0	0	(D)	0	0	0	
Other services.....	701,72,75-79,81,	(D)	(D)	0	0	(D)	0	(D)	

See explanatory information and SOURCE at end of table.

Table A-35. Total (company, Federal, and other) funds for industrial applied R&D performance, by industry, size of company, and detailed product field: 1997

Page 12 of 12

Industry	SIC code	Electrical equipment		Transportation equipment			Professional and scientific instruments		
		Electronic components and accessories	Other electrical equipment and supplies	Motor vehicles and equipment	Other transportation equipment	Aircraft and parts	Guided missiles and spacecraft	Scientific and mechanical measuring instruments	
		367	363-64, 368-69	371	379	372	376	381-82	
[Dollars in millions]									
Distribution by industry:									
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	(D)	0	(D)	0	(D)	0	0	
Distribution by size of company: [Number of employees]									
Total.....		7,763	798	7,901	135	1,551	708	1,491	
Fewer than 500.....		276	42	181	(D)	(D)	21	98	
500 to 999.....		264	48	254	36	(D)	(D)	107	
1,000 to 4,999.....		1,892	95	260	(D)	157	(D)	397	
5,000 to 9,999.....		1,215	55	(D)	(D)	13	(D)	(D)	
10,000 to 24,999.....		483	242	387	(D)	(D)	(D)	(D)	
25,000 or more.....		3,634	317	(D)	11	(D)	(D)	(D)	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NOTE: Imputation of R&D expenditures by product field was eliminated beginning in 1985. This table, therefore, contains only data reported by survey respondents who received Form RD-1L. See Table A-34 for coverage ratios showing the percentage of each industry's applied research and development funds that respondents distributed by product field.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-36. Total (company, Federal, and other) funds for industrial energy R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 1 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
All Industries.....		3,576	3,706	3,789	4,004	4,615	3,225	2,747	2,549	2,330	2,184	1,640	1,375	
Distribution by industry:														
Manufacturing.....		3,143	3,155	3,175	3,274	3,918	2,631	2,111	1,740	1,797	1,763	1,269	1,033	
Food, kindred, and tobacco products.....	20,21	(S)	(3)	(D)	(D)	(D)	0	(D)	(D)	0	(D)	0	0	
Textiles and apparel.....	22,23	(D)	(D)	(D)	(D)	0	0	0	0	0	0	0	0	
Lumber, wood products, and furniture.....	24,25	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	0	
Paper and allied products.....	26	1	1	(D)	(D)	(D)	1	(D)	(D)	(D)	(D)	(D)	(D)	
Chemicals and allied products.....	28	(S)	(S)	111	417	(D)	72	(D)	(D)	(D)	(D)	(D)	(D)	
Industrial chemicals.....	281-82,286	(D)	(D)	108	414	(D)	66	(D)	(D)	(D)	(D)	(D)	(D)	
Drugs and medicines.....	283	(D)	(D)	(D)	(D)	(D)	0	0	0	0	0	0	0	
Other chemicals.....	284-85,287-89	2	4	(D)	(D)	(D)	0	(D)	2	2	2	6	7	
Petroleum refining and extraction.....	13,29	914	1,056	1,128	1,177	1,416	1,150	798	(D)	(D)	(D)	387	413	
Rubber products.....	30	(D)	(D)	(D)	(D)	(D)	(D)	2	(D)	(D)	(D)	(D)	(D)	
Stone, clay, and glass products.....	32	1	(D)	1	(D)	(D)	(D)							
Primary metals.....	33	18	21	(D)	(D)	26	3	17	68	(D)	(D)	(D)	(D)	
Ferrous metals and products.....	331-32,3398-99	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Nonferrous metals and products.....	333-36	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Fabricated metal products.....	34	(D)	(D)	14	49	2	(D)	(D)	1	(D)	(D)	(D)	(D)	
Machinery.....	35	(D)	244	260	254	(S)	154	(D)	(D)	(D)	(D)	(D)	(D)	
Office, computing, and accounting machines.....	357	(D)	(D)	(D)	0	(D)	(D)	0	0	0	0	0	0	
Other machinery, except electrical.....	351-56,358-59	(D)	(D)	(D)	235	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Electrical equipment.....	36	578	680	647	627	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Radio and TV receiving equipment.....	365	0	0	0	0	0	0	0	0	0	0	0	0	
Communication equipment.....	366	(D)	(D)	(D)	(D)	(D)	(D)	(D)	12	(D)	(D)	(D)	(D)	
Electronic components.....	367	(D)	(D)	(D)	(D)	(D)	8	14	(D)	(D)	(D)	(D)	0	
Other electrical equipment.....	361-64,369	(S)	(D)	(D)	(D)									

See explanatory information and SOURCE at end of table.

Table A-36. Total (company, Federal, and other) funds for industrial energy R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 2 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
Distribution by industry:														
Transportation equipment.....	37	(S)	(D)	847	863	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	0	0	0	0	0	0	0	0	0
Aircraft and missiles.....	372,376	754	652	577	626	(D)	478	381	(D)	(D)	(D)	(D)	(D)	(D)
Professional and scientific instruments.....	38	17	16	12	11	(S)	(S)	(D)	(D)	(D)	0	1	1	1
Scientific and mechanical measuring instruments	381-82	(D)	(D)	(D)	(D)	(D)	(D)	0	(D)	0	0	1	1	1
Optical, surgical, photographic, and other instruments.....	384-87	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	0	0	0	0
Other manufacturing industries ³	27,31,39	0	0	(D)	(D)	(D)	0	0	0	(D)	0	0	0	0
Nonmanufacturing ²	433	551	614	730	697	594	636	809	533	421	371	342		
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	106	100	76	66	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	106	(D)	(D)	(D)	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	0	(D)	(D)	(D)	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	0	0	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	218 (S)	94	169	112	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	0	0	(D)	(D)	
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	0	0	(D)	(D)	

See explanatory information and SOURCE at end of table.

Table A-36. Total (company, Federal, and other) funds for industrial energy R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 3 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
Distribution by industry:														
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	0	0	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	0	0	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Engineering and management services	87	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	(D)	
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	93	80	98	80	
Research, development, and testing	873	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	(D)	
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other nonmanufacturing industries ³	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	(D)	

See explanatory information and SOURCE at end of table.

Table A-36. Total (company, Federal, and other) funds for industrial energy R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 4 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
Distribution by size of company: [Number of employees]														
Total.....		NA	NA	NA	NA	NA	NA	NA	2,549	2,330	2,184	1,640	1,375	
Fewer than 500.....		NA	NA	NA	NA	NA	NA	NA	28	39	39	101	50	
500 to 999.....		NA	NA	NA	NA	NA	NA	NA	86	22	24	11	9	
1,000 to 4,999.....		NA	NA	NA	NA	NA	NA	NA	76	45	24	112	131	
5,000 to 9,999.....		NA	NA	NA	NA	NA	NA	NA	48	48	47	10	7	
10,000 to 24,999.....		NA	NA	NA	NA	NA	NA	NA	782	749	640	437	472	
25,000 or more.....		NA	NA	NA	NA	NA	NA	NA	1,529	1,427	1,410	971	706	

¹ Total (company, Federal, and other) funds for industrial energy R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.³ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-37. Company and other (except Federal) funds for industrial energy R&D performance, by selected industry: 1987-97 and projected 1998													
Industry	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
		[Dollars in millions]											
Total.....		2,410	2,317	2,418	2,558	2,691	2,084	1,694	1,660	1,360	1,306	884	927
Chemicals and allied products.....	28	(D)	59	97	412	(D)	(D)	(D)	(D)	35	35	46	44
Petroleum refining and extraction	13,29	911	1,050	1,124	1,174	1,409	1,143	790	596	646	617	387	413
Machinery.....	35	(D)	229	246	220	(S)	146	177	270	108	110	78	74
Electrical equipment.....	36	(D)	123	92	90	101	159	114	174	(D)	(D)	(D)	(D)
Aircraft and missiles.....	372,376	(D)	211	160	199	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
All other manufacturing industries.....		564	450	451	173	(S)	41	24	73	30	33	27	29
Nonmanufacturing industries.....	07-10,12-17, 40-42,44-49, 50-59,60-65,67, 701,73,75-76, 78-79,80-81, 83-84,87,89	170	195	248	290	274	281	403	449	398	(D)	269	281

¹ Total (company, Federal, and other) funds for industrial energy R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTES: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-38. Federal funds for industrial energy R&D performance, by selected industry: 1987-97 and projected 1998													
Industry	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
		[Dollars in millions]											
Total.....		1,166	1,389	1,371	1,446	1,924	1,141	1,053	888	970	878	756	448
Chemicals and allied products....	28	(D)	13	14	5	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Petroleum refining and extraction.....	13,29	3	6	4	3	6	7	8	(D)	(D)	(D)	0	0
Machinery.....	35	(D)	15	14	34	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Electrical equipment.....	36	(D)	557	555	537	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles.....	372,376	(D)	441	417	427	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
All other manufacturing industries.....		5	1	0	2	1	2	2		1	1	0	0
Nonmanufacturing industries.....	07-10,12-17, 40-42,44-49, 50-59,60-65,67, 701,73,75-76, 78-79,80-81, 83-84,87,89	263	356	367	438	423	313	233	359	134	49	102	61

¹ Total (company, Federal, and other) funds for industrial energy R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

NOTES: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-39. Total (company, Federal, and other) funds for industrial energy R&D performance, by primary energy source: 1987-97 and projected 1998

Primary energy source	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
	[Dollars in millions]											
Total.....	3,576	3,706	3,789	4,004	4,615	3,225	2,747	2,549	2,330	2,184	1,640	1,375
Fossil fuels.....	1,548	1,583	1,652	1,879	2,128	1,498	1,082	966	811	838	752	737
Oil.....	(S)	NA	(S)	NA	(S)	NA	693	NA	608	627	328	289
Gas.....	191	NA	(S)	NA	(S)	NA	215	NA	124	104	150	158
Shale.....	11	NA	77	NA	(S)	NA	(D)	NA	0	0	(D)	(D)
Coal.....	46	NA	(S)	NA	(S)	NA	97	NA	62	(D)	155	132
Synthetic fossil fuels.....	23	NA	17	NA	(S)	NA	23	NA	(D)	(D)	37	(D)
Mining.....	3	NA	(S)	NA	(S)	NA	(D)	NA	3	(D)	31	29
Other.....	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)	87	(D)
Other fossil fuels.....	51	NA	(S)	NA	58	NA	(D)	NA	17	(D)	(D)	(D)
Nuclear.....	926	1,098	919	973	1,139	849	818	(D)	255	160	86	91
Fission.....	859	NA	856	NA	1,134	NA	(D)	NA	(D)	(D)	58	(D)
Fusion.....	(S)	NA	63	NA	5	NA	(D)	NA	(D)	(D)	28	(D)
Total geothermal, solar, and conservation and utilization.....	421	492	612	(D)	866	608	442	469	380	353	149	147
Geothermal.....	48	NA	(D)	NA	(S)	NA	90	NA	(D)	(D)	(D)	(D)
Solar.....	95	NA	(D)	NA	(S)	NA	59	NA	(D)	(D)	(D)	(D)
Conservation and utilization.....	281	NA	391	NA	(S)	NA	293	NA	219	201	101	104
All other energy.....	(S)	533	606	681	507	271	404	(D)	884	833	652	399

¹ Total (company, Federal, and other) funds for industrial energy R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: Detailed data for 1987 were estimated on the basis of (a) data actually reported that year, (b) revised data for the year reported on the 1988 survey form, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-40. Company and other (except Federal) funds for industrial energy R&D performance, by primary energy source: 1987-97 and projected 1998

Primary energy source	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
	[Dollars in millions]											
Total.....	2,410	2,317	2,418	2,558	2,691	2,084	1,694	1,660	1,360	1,306	884	927
Fossil fuels.....	(D)	1,519	1,485	1,704	1,869	1,414	1,003	874	787	816	679	693
Oil.....	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	623	(D)	282
Gas.....	(S)	NA	(S)	NA	(S)	NA	210	NA	(D)	(D)	146	(D)
Shale.....	(S)	NA	(S)	NA	(S)	NA	0	NA	0	0	(D)	(D)
Coal.....	29	NA	(S)	NA	(S)	NA	57	NA	43	73	123	100
Synthetic fossil fuels.....	(S)	NA	(D)	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
Mining.....	(D)	NA	(D)	NA	(D)	NA	0	NA	3	(D)	17	7
Other.....	(D)	NA	(S)	NA	(D)	NA	(D)	NA	(D)	(D)	(D)	(D)
Other fossil fuels.....	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
Nuclear.....	109	117	39	72	46	72	58	(D)	(D)	(D)	47	(D)
Fission.....	82	NA	27	NA	45	NA	(D)	NA	63	(D)	(D)	(D)
Fusion.....	(S)	NA	12	NA	1	NA	(D)	NA	(D)	(D)	(D)	(D)
Total geothermal, solar, and conservation and utilization.....	(D)	314	416	278	478	474	307	300	245	226	(D)	(D)
Geothermal.....	(D)	NA	(D)	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
Solar.....	41	NA	(D)	NA	(S)	NA	(D)	NA	14	(D)	(D)	(D)
Conservation and utilization.....	(D)	NA	384	NA	(S)	NA	203	NA	(D)	(D)	(D)	(D)
All other energy.....	(D)	367	478	504	298	124	325	(D)	(D)	(D)	(D)	(D)

¹ Total (company, Federal, and other) funds for industrial energy R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: Detailed data for 1987 were estimated on the basis of (a) data actually reported that year, (b) revised data for the year reported on the 1988 survey form, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-41. Federal funds for industrial energy R&D performance, by primary energy source: 1987-97 and projected 1998

Primary energy source	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
	[Dollars in millions]											
Total.....	1,166	1,389	1,371	1,446	1,924	1,141	1,053	888	970	878	756	448
Fossil fuels.....	(D)	63	(D)	(D)	(S)	84	79	92	24	22	73	44
Oil.....	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	4	(D)	7
Gas.....	(D)	NA	(S)	NA	(S)	NA	5	NA	(D)	(D)	4	(D)
Shale.....	(D)	NA	(S)	NA	(S)	NA	(D)	NA	0	0	(D)	0
Coal.....	17	NA	(S)	NA	(S)	NA	40	NA	19	(D)	32	32
Synthetic fossil fuels.....	8	NA	(D)	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
Mining.....	(D)	NA	(D)	NA	(D)	NA	(D)	NA	0	0	14	22
Other.....	(D)	NA	(S)	NA	(D)	NA	(S)	NA	(D)	(D)	(D)	(D)
Other fossil fuels.....	1	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
Nuclear.....	817	979	859	885	1,093	776	759	536	(D)	(D)	39	(D)
Fission.....	777	NA	809	NA	1,089	NA	(D)	NA	(D)	(D)	(D)	(D)
Fusion.....	(S)	NA	50	NA	4	NA	(D)	NA	(D)	(D)	(D)	(D)
Total geothermal, solar, and conservation and utilization.....	(D)	178	(D)	(D)	(S)	135	136	169	135	127	(D)	(D)
Geothermal.....	(D)	NA	(D)	NA	11	NA	(D)	NA	(D)	(D)	7	9
Solar.....	37	NA	(D)	NA	38	NA	(D)	NA	(D)	(D)	(D)	(D)
Conservation and utilization.....	(D)	NA	(D)	NA	(S)	NA	(S)	NA	(D)	(D)	(D)	(D)
All other energy.....	(D)	165	(D)	174	(S)	146	79	91 (S)	(D)	(D)	(D)	(D)

¹ Total (company, Federal, and other) funds for industrial energy R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: Detailed data for 1987 were estimated on the basis of (a) data actually reported, (b) revised reported data from the 1988 survey form, and (c) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-42. Number of companies performing industrial energy R&D and total number of R&D-performing companies, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Size of company											
		Total all companies		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees	
		Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy
All Industries.....		35,112	88	31,995	22	1,127	6	1,302	18	322	7	199	23
Manufacturing.....		18,130	52	15,898	7	886	4	938	12	197	3	138	16
Food, kindred, and tobacco products....	20,21	696	1	426	0	112	0	115	0	17	0	15	1
Textiles and apparel.....	22,23	278	0	181	0	44	0	41	0	3	0	7	0
Lumber, wood products, and furniture.....	24,25	257	0	162	0	52	0	29	0	10	0	4	0
Paper and allied products.....	26	121	2	57	0	2	0	41	0	6	1	9	0
Chemicals and allied products.....	28	602	11	424	0	32	4	95	2	27	1	17	3
Industrial chemicals.....	281-82,286	161	4	91	0	8	0	42	0	11	0	7	3
Drugs and medicines.....	283	199	0	159	0	3	0	22	0	7	0	5	0
Other chemicals.....	284-85,287-89	242	7	174	0	21	4	32	2	9	1	5	0
Petroleum refining and extraction.....	13,29	26	8	2	0	3	0	11	1	0	0	7	5
Rubber products.....	30	639	2	459	0	93	0	73	2	7	0	5	0
Stone, clay, and glass products.....	32	98	1	65	0	10	0	13	0	5	0	5	1
Primary metals.....	33	250	4	126	0	63	0	31	1	17	1	10	1
Ferrous metals and products.....	331-32,3398-99	54	3	11	0	4	0	17	0	14	1	8	1
Nonferrous metals and products.....	333-36	196	1	116	0	59	0	14	1	3	0	2	0
Fabricated metal products.....	34	903	3	731	3	74	0	74	0	10	0	11	0
Machinery.....	35	1,536	10	1,233	1	108	0	144	5	28	0	18	3
Office, computing, and accounting machines.....	357	119	0	77	0	10	0	16	0	8	0	6	0
Other machinery, except electrical.....	351-56,358-59	1,417	10	1,156	1	98	0	128	5	20	0	12	3
Electrical equipment.....	36	1,547	4	1,217	1	140	0	136	1	33	0	11	1
Radio and TV receiving equipment.....	365	19	0	14	0	2	0	3	0	0	0	0	0
Communication equipment.....	366	322	2	255	1	25	0	23	1	16	0	0	3
Electronic components.....	367	748	0	625	0	60	0	46	0	10	0	5	0
Other electrical equipment.....	361-64,369	460	2	323	0	54	0	64	0	7	0	6	1

See explanatory information and SOURCE at end of table.

Table A-42. Number of companies performing industrial energy R&D and total number of R&D-performing companies, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Size of company													
		Total all companies		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees			
		Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy		
Transportation equipment.....	37	411	4	302	0	54	0	18	0	14	0	10	1	13	3
Motor vehicles and motor vehicles equipment	371	377	1	300	0	51	0	6	0	8	0	8	1	4	0
Other transportation equipment.....	373-75,379	10	0	0	0	2	0	4	0	1	0	1	0	2	0
Aircraft and missiles.....	372,376	24	3	2	0	1	0	8	0	5	0	1	0	7	3
Professional and scientific instruments	38	760	2	611	2	58	0	74	0	10	0	3	0	5	0
Scientific and mechanical measuring instruments.....	381-82	515	2	440	2	37	0	29	0	4	0	2	0	3	0
Optical, surgical, photographic, and other instruments.....	384-87	246	0	171	0	21	0	45	0	6	0	1	0	2	0
Other manufacturing industries ¹	27,31,39	10,005	0	9,901	0	40	0	44	0	10	0	6	0	4	0
Nonmanufacturing.....		16,982	36	16,097	15	241	2	364	6	125	4	61	7	94	2
Transportation and utilities.....	40-42,44-49	417	15	204	0	5	0	65	4	67	4	10	6	66	1
Communications.....	48	90	0	24	0	2	0	4	0	51	0	0	0	9	0
Telephone communications.....	481	59	0	0	0	0	0	0	0	51	0	0	0	8	0
Other communications.....	482-484,489	31	0	24	0	2	0	4	0	0	0	0	0	1	0
Electric, gas, and sanitary services.....	49	161	14	77	0	2	0	57	4	14	4	9	6	2	0
Other transportation and utilities.....	40-42,44-47	166	1	103	0	1	0	4	0	2	0	1	0	55	1
Trade.....	50-59	3,713	0	3,567	0	14	0	73	0	20	0	30	0	10	0
Finance, insurance, and real estate.....	60-65,67	382	0	309	0	31	0	23	0	9	0	3	0	7	0
Services.....	701,72,73,75-81, 83,84,87,89	4,891	18	4,482	13	182	2	179	2	20	0	17	1	11	0
Business services.....	73	2,455	1	2,276	0	84	0	65	1	14	0	5	0	10	0
Computer and data processing services.....	737	2,273	0	2,144	0	63	0	51	0	10	0	3	0	3	0
Other business services.....	731-736,738	181	1	133	0	22	0	14	1	4	0	2	0	7	0

See explanatory information and SOURCE at end of table.

Table A-42. Number of companies performing industrial energy R&D and total number of R&D-performing companies, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Size of company											
		Total all companies		Fewer than 500 employees		500 to 999 employees		1,000 to 4,999 employees		5,000 to 9,999 employees		10,000 to 24,999 employees	
		Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy	Total	Energy
Health services.....	80	483	0	456	0	3	0	21	0	0	0	3	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	427	0	404	0	3	0	17	0	0	0	3	0
Other health services.....	802-805,808-809	56	0	52	0	0	0	4	0	0	0	0	0
Engineering and management services	87	1,569	17	1,495	13	42	2	23	1	3	0	5	1
Engineering, architectural, and surveying	871	697	8	661	5	14	1	18	1	1	0	3	1
Research, development, and testing	873	727	9	711	8	13	1	2	0	0	0	0	1
Other engineering and management services.....	872, 874	145	0	123	0	15	0	3	0	2	0	2	0
Other services.....	701,72,75-79,81, 83,84,89	385	0	255	0	53	0	70	0	3	0	4	0
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	7,579	3	7,535	2	8	0	24	0	9	0	1	1

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

NOTES: Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-43. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 1 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
All Industries.....		(S)	(S)	1,372	1,044	1,326	638	845	931	(D)	627	462	291	
Distribution by industry:														
Manufacturing.....		(S)	(S)	1,372	1,044	1,186	583	769	739	594	513	381	210	
Food, kindred, and tobacco products.....	20,21	1	1	3	2	4	2	(S)	4	4	(D)	(D)	(D)	
Textiles and apparel.....	22,23	⁴	(S)	⁴	(S)	(S)	(S)	0	(D)	(D)	(D)	(D)	(D)	
Lumber, wood products, and furniture.....	24,25	(D)	(D)	(D)	(D)	(D)	1	1	2	(D)	(D)	(D)	(D)	
Paper and allied products.....	26	7	9	19	18	13	10	14	15	10	7	5	5	
Chemicals and allied products.....	28	117	136	178	163	188	127	(D)	157	101	88	12	15	
Industrial chemicals.....	281-82,286	(D)	117	61	(D)	(S)	87	135	134	93	80	10	(D)	
Drugs and medicines.....	283	(D)	(D)	(D)	(D)	16	16	(D)	(D)	(D)	(D)	(D)	(D)	
Other chemicals.....	284-85,287-89	12	(D)	(D)	67	26	24	(D)	(D)	(D)	(D)	(D)	3	
Petroleum refining and extraction.....	13,29	51	60	75	72	111	107	111	102	34	43	40	31	
Rubber products.....	30	(D)	(S)	1	1	1	1	(D)	2	2	(D)	(D)	3	
Stone, clay, and glass products.....	32	(D)	(D)	(D)	(D)	(D)	39	44	47	(D)	(D)	(D)	(D)	
Primary metals.....	33	5	9	10	8	(S)	4	3	(D)	19	11	12	2	
Ferrous metals and products.....	331-32,3398-99	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Nonferrous metals and products.....	333-36	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Fabricated metal products.....	34	(D)	(D)	1	2	5	7	14	13	11	11	1	2	
Machinery.....	35	38	46	111	116	(S)	91	186	(D)	222	194	(D)	(D)	
Office, computing, and accounting machines	357	0	0	0	0	(D)	0	(D)	(D)	0	0	0	0	
Other machinery, except electrical.....	351-56,358-59	38	46	111	116	(D)	91	(D)	(D)	222	194	(D)	(D)	
Electrical equipment.....	36	(D)	(D)	9	11	(D)	(D)	(D)	33	(D)	(D)	16	17	
Radio and TV receiving equipment.....	365	0	0	0	0	0	0	0	0	0	0	0	0	
Communication equipment.....	366	(D)	(D)	7	8	(D)	(D)	(D)	(D)	(D)	(D)	0	0	
Electronic components.....	367	(D)	0	(D)	2	1	(D)	3	3	(D)	(D)	(D)	(D)	
Other electrical equipment.....	361-64,369	(D)	(D)	(D)	1	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	

See explanatory information and SOURCE at end of table.

Table A-43. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 2 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
Distribution by industry:														
Transportation equipment.....	37	(S)	(S)	(S)	(S)	(S)	145	174	110	109	78	134	100	
Motor vehicles and motor vehicles equipment	371	(D)	(D)	(D)	(D)	(D)	74	80	(D)	(D)	123	87		
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	(D)	0	(D)	(D)	0	(D)	(D)	(D)	
Aircraft and missiles.....	372,376	123	103	120	195	114	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Professional and scientific instruments.....	38	(D)	3	(D)	4	10	6	8	(D)	13	8	(D)	(D)	
Scientific and mechanical measuring instruments	381-82	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(S) 8	(D)	0	(D)	
Optical, surgical, photographic, and other instruments.....	384-87	(D)	(D)	(D)	(D)	(D)	(D)	(D)	\$6	5	(D)	(D)	(D)	
Other manufacturing industries ²	27,31,39	(D)	(D)	1	(1)	(D)	(D)	(D)	(D)	0	0	0	0	
Nonmanufacturing ³		113	(S)	(S)	(S)	140	55	76	193	(S) 299	113	81	80	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	91	63	52	53	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	91	(D)	52	53	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	0	(D)	0	0	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	(D)	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	(D)	20	20	17	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	0	0	(D)	(D)	
Computer and data processing services	737	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	0	0	(D)	(D)	

See explanatory information and SOURCE at end of table.

Table A-43. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 3 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
Distribution by industry:														
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	0	0	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	0	0	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	20	17	
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	14	6	
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	6	11	
Other engineering and management services	872,874	NA	NA	NA	NA	NA	NA	NA	NA	0	0	0	0	
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	0	0	(D)	(D)	
Other nonmanufacturing industries ²	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	1	(D)	(D)	(D)	

See explanatory information and SOURCE at end of table.

Table A-43. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by industry and size of company: 1987-97 and projected 1998

Page 4 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998	
		[Dollars in millions]												
Distribution by size of company: [Number of employees]														
Total.....		NA	NA	NA	NA	NA	NA	NA	931	892	627	462	291	
Fewer than 500.....		NA	NA	NA	NA	NA	NA	NA	13	23	18	20	16	
500 to 999.....		NA	NA	NA	NA	NA	NA	NA	2	12	12	9	12	
1,000 to 4,999.....		NA	NA	NA	NA	NA	NA	NA	74	64	47	68	80	
5,000 to 9,999.....		NA	NA	NA	NA	NA	NA	NA	60	75	66	42	45	
10,000 to 24,999.....		NA	NA	NA	NA	NA	NA	NA	307	374	212	159	93	
25,000 or more.....		NA	NA	NA	NA	NA	NA	NA	475	344	271	163	44	

¹ Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

² Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

³ Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

⁴ Less than \$0.5 million.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-44. Company and other (except Federal) funds for industrial pollution-abatement R&D performance, by selected industry: 1987-97 and projected 1998

Industry	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
		[Dollars in millions]											
Total.....		(S)	(S)	(S)	955	(S)	545	735	734	830	602	449	279
Chemicals and allied products.....	28	(D)	(D)	(D)	163	188	126	149	153	101	88	12	15
Petroleum refining and extraction.....	13,29	51	60	(D)	(D)	110	106	111	102	34	43	40	31
Machinery.....	35	38	46	(D)	116	(S)	90	186	(D)	222	194	(D)	(D)
Electrical equipment.....	36	(D)	(D)	(D)	(D)	(D)	(D)	(D)	33	(D)	(D)	(D)	(D)
Aircraft and missiles.....	372,376	62	(D)	70	(D)	51	(D)	28	(D)	(D)	(D)	(D)	(D)
All other manufacturing industries.....		(D)	(D)	737	406	(S)	84	(D)	192	184	141	169	121
Nonmanufacturing industries ²	07-10,12-17, 40-42,44-49, 50-59,60-65,67, 701,73,75-76, 78-79,80-81, 83-84,87,89	(D)	(D)	58	(D)	(D)	38	44	56	241 (S)	92	71	70

¹ Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

² Nonmanufacturing industries for 1990 and prior years included only the following SICs: 10 11, 14 17, 40 42, 44 51, 53 54, 56, 60, 62 63, 72 73, 78, 806, 807, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NOTES: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-45. Federal funds for industrial pollution-abatement R&D performance, by selected industry: 1987-97 and projected 1998

Industry	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
Total.....		186	191	(S)	89	92	93	110	198	(D)	25	13	12
Chemicals and allied products.....	28	(D)	(D)	(D)	0	0	(D)	(D)	(D)	0	0	0	0
Petroleum refining and extraction.....	13,29	0	0	(D)	(D)	(D)	(D)	0	0	0	0	0	0
Machinery.....	35	0	0	(D)	0	0	(D)	0	(D)	0	0	0	0
Electrical equipment.....	36	(D)	(D)	(D)									
Aircraft and missiles.....	372,376	61	(D)	50	(D)	(D)	(D)						
All other manufacturing industries.....		(D)	0	0	(D)	(D)	2	0	54	1	1	0	0
Nonmanufacturing industries ²	07-10,12-17, 40-42,44-49, 50-59,60-65,67, 701,73,75-76, 78-79,80-81, 83-84,87,89	(D)	(D)	(D)	(D)	(D)	18	(S)	(D)	(D)	21	11	10

¹ Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

² Nonmanufacturing industries for 1990 and prior years included the following SICs only: 10 11, 14 17, 40 42, 44 51, 53-54, 56, 60, 62 63, 72 73, 78, 806 07, and 87.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NOTES: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-46. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance, by type of pollution: 1987-97 and projected 1998

Type of pollution	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996 ¹	1997	Projected 1998
[Dollars in millions]												
Total.....	(S)	(S)	(S)	1,044	(S)	638	845	931	(D)	627	462	291
Air.....	(S)	NA	(S)	NA	(S)	NA	489	NA	(D)	(D)	(D)	(D)
Automotive emission.....	(S)	NA	(S)	NA	(S)	NA	127	NA	122	94	(D)	(D)
Electric power plant emissions.....	16	NA	36	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
All other.....	(S)	NA	(S)	NA	(S)	NA	(D)	NA	(D)	(D)	(D)	(D)
Water.....	(S)	NA	(S)	NA	(S)	NA	87	NA	68	53	(D)	(D)
Solid waste.....	206	NA	(S)	NA	(S)	NA	124	NA	59	42	32	(D)
Other.....	90	NA	85	NA	(S)	NA	145	NA	(D)	(D)	(D)	(D)

¹ Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

14

NOTES: Detailed data for 1987 were estimated on the basis of (a) data actually reported, (b) revised reported data, (c) revised data for 1987 reported on the 1988 survey forms, and (d) adjustments to a new sample design in 1987.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-47. Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance,
by type of pollution and source of funds: 1996-97 and projected 1998**

Type of pollution	1996 ¹			1997			Projected 1998		
	Total	Federal	Company	Total	Federal	Company	Total	Federal	Company
	[Dollars in millions]								
Total.....	627	25	602	462	13	449	291	12	279
Air.....	(D)	(D)	428	(D)	(D)	305	(D)	(D)	176
Automotive emission.....	94	0	94	(D)	(D)	116	(D)	(D)	114
Electric power plant emissions.....	(D)	(D)	69	(D)	(D)	20	(D)	(D)	10
All other.....	(D)	(D)	265	(D)	(D)	166	(D)	(D)	53
Water.....	53	0	52	(D)	(D)	35	(D)	(D)	21
Solid waste.....	42	5	37	32	4	29	(D)	(D)	16
Other.....	(D)	(D)	85	(D)	(D)	79	(D)	(D)	64

¹ Total (company, Federal, and other) funds for industrial pollution-abatement R&D performance were not collected in 1996. As a result, the published 1996 data are the projected 1996 data as collected in 1995.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

NOTES: Energy and pollution-abatement R&D data are collected only on Form RD-1L, which is sent to larger R&D-performing companies for odd-numbered survey years (see the technical notes in Section B of this report for an explanation of the various survey questionnaires). Consequently, the universe of companies that perform energy or pollution-abatement R&D may not be represented by the statistics in this table.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-48. Total (company, Federal, and other) funds for industrial R&D performance in selected years by state: 1977-97

Page 1 of 3

Area	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
	[Dollars in millions]										
United States	29,825	38,226	51,810	65,268	84,239	92,155	102,055	116,952	117,400	132,103	157,539
Northeast.....	8,687	10,296	14,270	18,957	24,837	24,549	27,998	35,170	30,198	35,030	40,616
New England.....	2,400	3,003	3,855	4,680	7,456	7,965	8,828	(S)	8,940	12,848	13,000
Maine.....	24	40	(T)	(T)	(D)	39	33	(S)	(D)	286	83
New Hampshire.....	(T)	(T)	(T)	(T)	(D)	90	(D)	(D)	247	472	652
Vermont.....	(T)	(T)	(T)	(T)	(D)	236	(D)	(D)	(D)	248	246
Massachusetts.....	1,349	1,690	1,907	2,466	4,495	5,255	5,851	(S)	5,960	7,416	8,300
Rhode Island.....	24	49	87	171	213	224	140	174	154	520	704 (S)
Connecticut.....	876	985	1,514	1,682	2,129	2,121	2,421	1,756	2,228	3,906	3,014
Middle Atlantic.....	6,287	7,293	10,415	14,277	17,381	16,583	19,170	25,553	21,258	22,182	27,616
New York.....	2,542	2,959	4,057	5,951	7,561	6,276	8,107	9,457	8,597	8,651	9,939 (S)
New Jersey.....	1,900	2,191	3,355	4,364	5,975	5,876	6,410	8,933	8,009	8,200	11,069
Pennsylvania.....	1,845	2,143	3,003	3,963	3,844	4,430	4,653	(S)	4,652	5,331	6,609 (S)
North Central.....	7,777	10,013	12,692	15,245	19,390	23,180	24,725	28,933	36,840	33,004	35,498
East North Central	6,270	8,065	9,742	11,967	15,254	17,635	19,395	24,017	31,800	26,592	29,249
Ohio.....	1,323	1,635	1,781	2,282	3,067	3,415	3,964	5,406	4,494	4,001	5,608
Indiana.....	541	723	1,054	(T)	(D)	1,860	1,823	2,274	2,141	2,721 (S)	2,677
Illinois.....	1,360	1,673	2,077	2,291	(D)	4,099	4,068	5,750	5,023	5,776 (S)	6,248
Michigan.....	2,750	3,614	4,272	5,716	6,436	7,095	8,506	9,283	18,845	12,388	13,009
Wisconsin.....	296	420	558	(T)	728	1,165	1,035	1,304	1,296	1,706	1,707
West North Central	1,507	1,948	2,950	3,278	4,136	5,545	5,331	4,916	5,041	6,412 (S)	6,249 (S)
Minnesota.....	602	802	1,180	1,814	(D)	2,145	2,075	2,070	2,341	2,636 (S)	3,116
Iowa.....	173	150	393	287	(D)	328	365	527	505	998	578
Missouri.....	630	746	1,137	(T)	(D)	1,823	2,391	(S)	1,339 (S)	2,028 (S)	1,290 (S)
North Dakota.....	(T)	(T)	(T)	(T)	10	57	(S)	(S)	(D)	12	33
South Dakota.....	(T)	(T)	(T)	(T)	(S)	4	4	6	(D)	19	26
Nebraska.....	14	15	28	26	(D)	59	64	67	93	150	71
Kansas.....	84	216	211	293	(D)	1,128	406	(S)	280 (S)	569	1,136 (S)

See explanatory information and SOURCE at end of table.

Table A-48. Total (company, Federal, and other) funds for industrial R&D performance in selected years by state: 1977-97

Page 2 of 3

Area	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
	[Dollars in millions]										
South.....	3,691	4,496	6,987	9,292	12,948	15,938	15,389	17,696	16,219	21,833	24,260
South Atlantic.....	2,012	2,592	4,012	5,000	7,338	8,811	8,136	(S)	9,394	12,885	14,167
Delaware.....	(T)	(T)	(T)	(T)	(D)	(D)	(D)	(D)	913 (S)	1,077 (S)	1,009 (S)
Maryland.....	382	424	(T)	(T)	1,548	1,292	1,093	1,376	1,296	1,075	1,425
District of Columbia.....	8	33	(T)	(T)	(D)	(D)	(D)	46	515 (S)	672 (S)	(D)
Virginia.....	318	464	539	941	862	1,284	1,131	1,275	1,046	1,577	1,767
West Virginia.....	(T)	(T)	(T)	(T)	(D)	83	(D)	(D)	100 (S)	243	(D)
North Carolina.....	268	327	546	786	(D)	1,666	1,311	1,470	1,886	2,226	3,590
South Carolina.....	96	82	(T)	(T)	(D)	500	388	479	461	739	783 (S)
Georgia.....	99	147	220	348	(D)	958	722	993	792	1,175	1,273
Florida.....	462	620	1,449	(T)	1,973	2,041	2,352	(S)	2,386	4,101	3,442
East South Central.....	467	402	624	1,007	1,302	2,425	1,647	1,662	1,678	2,207	2,110
Kentucky.....	100	209	170	191	(D)	238	227	176	282	452	359
Tennessee.....	306	(T)	(T)	(T)	(D)	621	934	843	788	1,003	1,089
Alabama.....	48	62	100	187	(S)	1,523	430	596	557 (S)	686	589 (S)
Mississippi.....	13	(T)	(T)	(T)	62	42	56	(S)	51	66	73
West South Central.....	1,212	1,502	2,351	3,285	4,307	4,702	5,605	6,205	5,146	6,741	7,983
Arkansas.....	10	11	52	(T)	(D)	129	51	(S)	179	181	118
Louisiana.....	106	83	158	257	(D)	128	169	(S)	106	61	172
Oklahoma.....	142	174	339	407	(D)	367	333	448	299	288	428
Texas.....	954	1,233	(T)	(T)	3,762	4,077	5,051	5,439	4,562	6,211 (S)	7,265
West.....	7,379	10,176	11,873	17,843	25,570	26,207	30,998	(S)	32,300	40,465	49,954
Mountain.....	1,034	1,139	2,135	2,845	3,766	4,272	4,113	5,931	5,026	6,676	8,120
Montana.....	(T)	(T)	(T)	(T)	(D)	7	(D)	(S)	(D)	17	92
Idaho.....	(T)	(T)	(T)	(T)	451	467	(D)	(S)	686	827	1,181 (S)
Wyoming.....	(T)	(T)	(T)	2	3	4	(D)	2	15	25	28
Colorado.....	257	269	529	741	988	1,207	1,167	(S)	1,966	1,865	2,248
New Mexico.....	(T)	(T)	(T)	(T)	(D)	950	1,039	1,217	(D)	1,461	1,310 (S)
Arizona.....	200	372	758	(T)	1,079	809	921	1,080	1,039	1,356 (S)	1,854
Utah.....	132	142	265	242	(D)	774	389	407	279	803	1,027
Nevada.....	72	(T)	(T)	(T)	(S)	55	29	95	65	322	380

See explanatory information and SOURCE at end of table.

Table A-48. Total (company, Federal, and other) funds for industrial R&D performance in selected years by state: 1977-97

Page 3 of 3

Area	1977	1979	1981	1983	1985	1987	1989	1991	1993	1995	1997
	[Dollars in millions]										
Pacific.....	6,345	9,037	9,738	14,998	21,804	21,935	26,884	(S)	27,274	33,789	41,834
Washington.....	681	(T)	(T)	(T)	2,351	2,939	2,728	3,677	4,575 (S)	4,294 (S)	6,610 (S)
Oregon.....	77	116	(T)	(T)	(D)	281	357	(S)	455	741	1,102
California.....	5,600	7,437	7,626	(T)	(S)	18,636	23,781	(S)	21,975	28,710	34,011
Alaska.....	(T)	(T)	(T)	(T)	(D)	10	9	21	14	30	24 (S)
Hawaii.....	(T)	(T)	(T)	(T)	13	70	9	13	255	14	87
Undistributed funds	2,291	3,245	(T)	3,931	1,495	2,281	2,945	772	683	1,773 (S)	7,211 (S)

KEY: (D) = Data have been withheld to avoid disclosing information about individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

(T) = Data are not separately available but included in total.

NOTES: The 1993 data collected during the 1995 survey includes respondent revisions for both total R&D and state R&D allocations. Companies new to the survey may not have reported data by state on the report form they received and may not have 1993 state data on their 1995 form. For companies such as these, 1993 state data were allocated to the state in which the company's headquarters was located.



As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-49. Total (company, Federal, and other) funds for industrial R&D performance,
by state and source of funds: 1997**

Page 1 of 2

Area	Total	Federal	Company
	[Dollars in millions]		
United States	157,539	23,928	133,611
Alabama.....	589 (S)	189 (S)	399
Alaska.....	24 (S)	(D)	(D)
Arizona.....	1,854	677 (S)	1,177
Arkansas.....	118	(D)	(D)
California.....	34,011	5,977 (S)	28,034
Colorado.....	2,248	525	1,723
Connecticut.....	3,014	307	2,707
Delaware.....	1,009 (S)	8	1,001
District of Columbia.....	(D)	(D)	(D)
Florida.....	3,442	1,461	1,981
Georgia.....	1,273	212	1,062
Hawaii.....	87	55	32
Idaho.....	1,181 (S)	(D)	(D)
Illinois.....	6,248	163 (S)	6,085
Indiana.....	2,677	(D)	(D)
Iowa.....	578	(D)	(D)
Kansas.....	1,136 (S)	(D)	(D)
Kentucky.....	359	3 (S)	356
Louisiana.....	172	(D)	(D)
Maine.....	83	(D)	(D)
Maryland.....	1,425	456	970
Massachusetts.....	8,300	1,397 (S)	6,903
Michigan.....	13,009	121	12,888
Minnesota.....	3,116	362 (S)	2,754
Mississippi.....	73	(D)	(D)
Missouri.....	1,290 (S)	30	1,260
Montana.....	92	(D)	(D)
Nebraska.....	71	(D)	(D)
Nevada.....	380	(D)	(D)
New Hampshire.....	652	(D)	(D)
New Jersey.....	11,069	117	10,952
New Mexico.....	1,310 (S)	(D)	(D)
New York.....	9,939 (S)	2,078 (S)	7,861
North Carolina.....	3,590	111	3,478
North Dakota.....	33	0	33
Ohio.....	5,608	604 (S)	5,004
Oklahoma.....	428	45	383
Oregon.....	1,102	28 (S)	1,075
Pennsylvania.....	6,609 (S)	672 (S)	5,937
Rhode Island.....	704 (S)	(D)	(D)

See explanatory information and SOURCE at end of table.

**Table A-49. Total (company, Federal, and other) funds for industrial R&D performance,
by state and source of funds: 1997**

Page 2 of 2

Area	Total	Federal	Company
	[Dollars in millions]		
South Carolina.....	783 (S)	83 (S)	700
South Dakota.....	26	0	26
Tennessee.....	1,089	(D)	(D)
Texas.....	7,265	784	6,481
Utah.....	1,027	199 (S)	829
Vermont.....	246	(D)	(D)
Virginia.....	1,767	851	916
Washington.....	6,610 (S)	(D)	(D)
West Virginia.....	(D)	(D)	(D)
Wisconsin.....	1,707	29	1,678
Wyoming.....	28	0	28
Undistributed funds.....	7,211 (S)	1,056 (S)	6,154

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-50. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company, for the U.S. and top 10 R&D-performing states: 1997

Page 1 of 4

Industry and size of company	SIC code	U.S. total	Top 10 states										All other states plus undistributed
			California	Michigan	New Jersey	New York	Massa- chusetts	Texas	Wash- ington	Penn- sylvania	Illinois	Ohio	
		[Dollars in millions]											
All Industries.....		157,539	34,011	13,009	11,069	9,939 (S)	8,300	7,265	6,610 (S)	6,609 (S)	6,248	5,608	48,871
Distribution by industry:													
Manufacturing.....		121,025	24,488	12,532	8,180	7,503	5,194	5,912	4,330 (S)	5,396	5,835	4,296	37,358
Food, kindred, and tobacco products	20,21	1,787	39	(D)	187	40	(D)	29	(D)	52	295	39	998
Textiles and apparel.....	22,23	(D)	(D)	3	(D)	26	23	10 (S)	0	(D)	0	(D)	397
Lumber, wood products, and furniture.....	24,25	348	35	75	37	(D)	0	1	(D)	(D)	3	5	179
Paper and allied products.....	26	(D)	(D)	(D)	(D)	63	24	(D)	(D)	17	48	26	1,123
Chemicals and allied products.....	28	(D)	1,674	1,003	3,543	902	429	453	(D)	2,388	1,378	981	6,216
Industrial chemicals.....	281-82,286	(D)	(D)	(D)	552 (S)	89 (S)	(D)	284 (S)	(D)	877	(D)	157 (S)	2,441
Drugs and medicines.....	283	11,589	1,285	(D)	2,746	504	252	139	(D)	1,409	(D)	(D)	3,321
Other chemicals.....	284-85,287-89	(D)	(D)	70	245	308 (S)	(D)	30	(D)	102	85 (S)	(D)	454
Petroleum refining and extraction.....	13,29	(D)	(D)	(D)	(D)	21	(D)	422	0	56	(D)	(D)	393
Rubber products.....	30	(D)	130	46	21	65	73	23	(D)	53	31	461 (S)	480
Stone, clay, and glass products.....	32	608	10	(D)	0	(D)	(D)	(D)	0	156	22 (S)	126	98
Primary metals.....	33	988	(D)	28	25 (S)	30 (S)	(D)	65 (S)	(D)	170 (S)	(D)	99	408
Ferrous metals and products.....	331-32, 3398-99	(D)	(D)	18	(D)	(D)	(D)	(D)	0	(D)	(D)	(D)	281
Nonferrous metals and products.....	333-36	(D)	(D)	11	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	127
Fabricated metal products.....	34	1,798	326	66	14	35	204	28	10	257	83	146	628
Machinery.....	35	18,499	5,818	989	(D)	1,485	656	1,153	(D)	381	716	369	5,618
Office, computing, and accounting machines.....	357	12,840	4,838	317	(D)	(D)	594	(D)	(D)	90	22 (S)	(D)	3,525
Other machinery, except electrical.....	351-56,358-59	5,659	980	671	97	(D)	61	(D)	(D)	291	694	(D)	2,094

See explanatory information and SOURCE at end of table.

Table A-50. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company, for the U.S. and top 10 R&D-performing states: 1997

Page 2 of 4

Industry and size of company	SIC code	U.S. total	Top 10 states										All other states plus undistributed
			California	Michigan	New Jersey	New York	Massa- chusetts	Texas	Wash- ington	Penn- sylvania	Illinois	Ohio	
[Dollars in millions]													
Distribution by industry:													
Electrical equipment.....	36	24,585	7,480	(D)	1,468	727	1,715	2,805 (S)	(D)	647	2,398	866	6,128
Radio and TV receiving equipment.....	365	(D)	48	(D)	(D)	(D)	(D)	0	(D)	(D)	(D)	0	11
Communication equipment.....	366	(D)	1,248	(D)	(D)	225	486	953	(D)	387	(D)	144	2,021
Electronic components.....	367	(D)	5,164 (S)	18	45	(D)	824	1,742 (S)	6	(D)	(D)	8	2,418
Other electrical equipment.....	361-64,369	4,909	1,021	135	171 (S)	393	(D)	110	(D)	112	245	714	1,678
Transportation equipment.....	37	31,993	4,225 (S)	9,623	25	(D)	29	(D)	(D)	401 (S)	144	722	10,173
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	(D)	36	(D)	(D)	(D)	41	75	(D)	2,439
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	(D)	0	0	(D)	(D)	(D)	(D)	320
Aircraft and missiles.....	372,376	16,296	(D)	179	22	(D)	(D)	(D)	(D)	(D)	(D)	(D)	7,413
Professional and scientific instruments.....	38	13,458	3,795	123	1,194	1,265	1,782 (S)	89	180	651	365 (S)	204	3,811
Scientific and mechanical measuring instruments.....	381-82	8,135	3,318	(D)	(D)	(D)	1,369 (S)	25	(D)	(D)	(D)	177	2,686
Optical, surgical, photographic, and other instruments.....	384-87	5,323	477	(D)	(D)	(D)	413	63	(D)	(D)	(D)	27	1,124
Other manufacturing industries ¹	27,31,39	2,798	626	249	89	95	222	128	57	154	239	231	709
Nonmanufacturing		36,514	9,523	477	2,888	2,435	3,106	1,353	2,281	1,212	413	1,311	11,513
Transportation and utilities.....	40-42,44-49	3,013	110	(D)	(D)	93	(D)	(D)	0	28	14	498	1,101
Communications.....	48	(D)	46	0	(D)	(D)	(D)	(D)	0	14	0	(D)	801
Telephone communications.....	481	(D)	(D)	0	(D)	(D)	(D)	(D)	0	(D)	0	(D)	777
Other communications.....	482-484,489	58	(D)	0	4	(D)	(D)	(D)	0	(D)	0	0	24

See explanatory information and SOURCE at end of table.

Table A-50. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company, for the U.S. and top 10 R&D-performing states: 1997

Page 3 of 4

Industry and size of company	SIC code	U.S. total	Top 10 states										All other states plus undistributed
			California	Michigan	New Jersey	New York	Massa- chusetts	Texas	Wash- ington	Penn- sylvania	Illinois	Ohio	
[Dollars in millions]													
Distribution by industry:													
Electric, gas, and sanitary services.....	49	(D)	39	(D)	4	44	12	16 (S)	0	(D)	(D)	(D)	100
Other transportation and utilities.....	40-42,44-47	(D)	24	(D)	(D)	(D)	0	(D)	0	(D)	(D)	454	200
Trade.....	50-59	(D)	2,348	(D)	715	919	1,102	421	31	131	46	71	2,190
Finance, insurance, and real estate.....	60-65,67	(D)	53	(D)	(D)	299	(D)	(D)	0	(D)	91	(D)	889
Services.....	701,72,73, 75-81,83,84, 87,89	22,400	6,561	398	1,214	1,016	1,766	751	2,210	955	214	596	6,720
Business services.....	73	11,960	3,350	201 (S)	855	616	790	530	1,893	227	117	127	3,254
Computer and data processing services.....	737	11,706	3,304	(D)	(D)	593	(D)	(D)	(D)	216	100	(D)	3,148
Other business services.....	731-736,738	254	45	(D)	(D)	23	(D)	(D)	(D)	11	17	(D)	106
Health services.....	80	(D)	37	0	(D)	(D)	0	0	(D)	(D)	(D)	0	71
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	(D)	0	(D)	(D)	0	0	0	(D)	15	0	36
Other health services.....	802-805, 808-809	49	(D)	0	(D)	0	0	0	(D)	0	(D)	0	35
Engineering and management services.....	87	9,290	2,872	195	329	393	(D)	220	315	(D)	76	462	3,254
Engineering, architectural, and surveying.....	871	2,039	323	58	59	64	(D)	(D)	(D)	21	17	107	1,142
Research, development, and testing.....	873	(D)	2,527	136	270	149	856	113	247	178	(D)	355	2,002
Other engineering and management services.....	872,874	(D)	21	1	0	180	(D)	(D)	(D)	(D)	5	0	110

See explanatory information and SOURCE at end of table.

Table A-50. Total (company, Federal, and other) funds for industrial R&D performance, by industry and size of company, for the U.S. and top 10 R&D-performing states: 1997

Page 4 of 4

Industry and size of company	SIC code	U.S. total	Top 10 states										All other states plus undistributed
			California	Michigan	New Jersey	New York	Massa- chusetts	Texas	Wash- ington	Penn- sylvania	Illinois	Ohio	
[Dollars in millions]													
Distribution by industry:													
Other services.....	701, 72, 75-79, 81, 83, 84, 89	(D)	302	2	(D)	(D)	(D)	0	(D)	(D)	(D)	6	141
Other nonmanufacturing industries ¹	07-12, 14, 15, 161-162, 17	1,618	452	68	34	108	5	(D)	40	(D)	49	(D)	613
Distribution by size of company: [Number of employees]													
Total.....		157,539	34,011	13,009	11,069	9,939	8,300	7,265	6,610 (S)	6,609	6,248	5,608	48,871
Fewer than 500.....		24,063	7,367	1,351	1,255	1,023	2,018	868	613	774	517	758	7,516
500 to 999.....		4,966	1,341	95	156	205	469	132	69	83	225	280	1,912
1,000 to 4,999.....		19,590	5,238	637 (S)	893	1,369	1,105	784	234	1,244	669	517	6,899
5,000 to 9,999.....		14,266	3,268	656	1,905	614 (S)	757	775	(D)	403	285	(D)	4,853
10,000 to 24,999.....		21,510	2,708	650	2,324	821	1,439	1,976 (S)	(D)	1,672	646 (S)	(D)	6,682
25,000 or more.....		73,144	14,089	9,619	4,535	5,907	2,511 (S)	2,730	(D)	2,433	3,907	(D)	21,010

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

**Table A-51. Total (company, Federal, and other) funds for industrial R&D performance, by industry,
size of company, and type of cost: 1997**

Page 1 of 2

Industry and size of company	SIC code	Total R&D costs	Wages of R&D personnel	Materials and supplies	Other costs
		[Dollars in millions]	[Percent]		
All Industries.....		157,539	47.0	17.5	35.5
Distribution by industry					
Manufacturing.....		121,025	45.5	18.9	35.6
Food, kindred, and tobacco product	20,21	1,787	48.2	11.1	40.7
Textiles and apparel.....	22,23	(D)	48.5	23.2 (S)	28.3
Lumber, wood products, and furniture.....	24,25	348	55.9	27.1	17.0
Paper and allied products.....	26	(D)	48.4 (S)	14.6 (S)	37.0
Chemicals and allied products.....	28	(D)	42.0	12.1	45.9
Industrial chemicals.....	281-82,286	(D)	48.8	13.1 (S)	38.1
Drugs and medicines.....	283	11,589	38.8	12.2	49.0
Other chemicals.....	284-85,287-89	(D)	42.8	8.8	48.4
Petroleum refining and extraction.....	13,29	(D)	43.2	11.8	45.0
Rubber products.....	30	(D)	45.9	21.5	32.6
Stone, clay, and glass products.....	32	608	41.0	13.7	45.3
Primary metals.....	33	988	51.9	16.6	31.5
Ferrous metals and products.....	331-32,3398-99	(D)	54.0	10.2	35.8
Nonferrous metals and products.....	333-36	(D)	50.3 (S)	25.0	24.7
Fabricated metal products.....	34	1,798	49.9	17.5	32.6
Machinery.....	35	18,499	50.6	16.5	32.9
Office, computing, and accounting machines.....	357	12,840	51.5	13.3	35.2
Other machinery, except electrical.....	351-56,358-59	5,659	48.6	24.5	26.9
Electrical equipment.....	36	24,585	49.0	21.0	30.0
Radio and TV receiving equipment.....	365	(D)	51.0	13.7	35.3
Communication equipment.....	366	(D)	50.5	31.6	17.9
Electronic components.....	367	(D)	50.4	15.8	33.8 (S)
Other electrical equipment.....	361-64,369	4,909	43.1	16.1	40.8
Transportation equipment.....	37	31,993	38.2 (S)	25.9	35.9
Motor vehicles and motor vehicles equipment.....	371	(D)	38.5	30.3	31.2
Other transportation equipment.....	373-75,379	(D)	51.8	20.8 (S)	27.5
Aircraft and missiles.....	372,376	16,296	38.4 (S)	22.4 (S)	39.2
Professional and scientific instruments.....	38	13,458	54.0	13.5	32.5
Scientific and mechanical measuring instruments....	381-82	8,135	54.2	12.5	33.3
Optical, surgical, photographic, and other instruments.....	384-87	5,323	53.6	15.0	31.4
Other manufacturing industries ¹	27,31,39	2,798	81.2	8.9	9.9
Nonmanufacturing		36,514	55.4	10.9	33.7
Transportation and utilities.....	40-42,44-49	3,013	50.9	8.9	40.2
Communications.....	48	(D)	49.5	7.9	42.6
Telephone communications.....	481	(D)	49.6	7.9	42.5
Other communications.....	482-484,489	58	52.5	3.8	43.7

See explanatory information and SOURCE at end of table.

Table A-51. Total (company, Federal, and other) funds for industrial R&D performance, by industry, size of company, and type of cost: 1997

Page 2 of 2

Industry and size of company	SIC code	Total R&D costs	Wages of R&D personnel	Materials and supplies	Other costs
		[Dollars in millions]	[Percent]		
Distribution by industry					
Electric, gas, and sanitary services.....	49	(D)	37.1	19.4	43.5
Other transportation and utilities.....	40-42,44-47	(D)	81.6	4.7 (S)	13.7
Trade.....	50-59	(D)	58.7	10.7	30.6 (S)
Finance, insurance, and real estate.....	60-65,67	(D)	70.9	9.1	20.0
Services.....	701,72,73,75-81, 83,84,87,89	22,400	53.1	11.6	35.3
Business services.....	73	11,960	60.4	6.1	33.5
Computer and data processing services.....	737	11,706	60.5	6.1	33.4
Other business services.....	731-736,738	254	56.9	5.1	38.0
Health services.....	80	(D)	49.7	28.6	21.7
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	(D)	50.4	29.8	19.8
Other health services.....	802-805,808-809	49	40.0	10.6	49.4
Engineering and management services.....	87	9,290	43.2	17.4	39.4
Engineering, architectural, and surveying.....	871	2,039	51.9	14.1	34.0
Research, development, and testing.....	873	(D)	39.7	18.8	41.5
Other engineering and management services....	872,874	(D)	87.7	0.2 (S)	12.1
Other services.....	701,72,75-79,81, 83,84,89	(D)	80.3	2.9	16.8
Other nonmanufacturing industries ¹	07-12,14,15,	1,618	85.0	4.4	10.6
Distribution by size of company:					
[Number of employees]					
Total.....		157,539	47.0	17.5	35.5
Fewer than 500.....		24,061	70.0	8.7	21.3
500 to 999.....		4,966	50.6	14.8	34.6
1,000 to 4,999.....		19,590	50.3	13.0	36.7
5,000 to 9,999.....		14,266	49.5	16.2	34.3
10,000 to 24,999.....		21,510	48.0	14.4	37.6
25,000 or more.....		73,144	44.1	20.5	35.4

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-52. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1987-98

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
		[In thousands]											
Total (January).....		695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8	885.7	951.5
Total (Annual average).....		702.2	715.6	733.0	758.5	776.4	772.0	766.6	757.3	789.4	859.3	918.6	NA
All Industries.....		695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8	885.7	951.5
Distribution by industry:													
Manufacturing.....		599.4	606.7	597.3	NA	NA	576.7	568.2	571.1	547.2	606.2	639.9	682.1
Food, kindred, and tobacco products.....	20,21	(S)	(S)	(S)	(S)	9.4	9.8	9.6	10.3	8.9	9.8	10.4	11.0
Textiles and apparel.....	22,23	2.4	2.4	2.5	2.8	(S)	2.8	3.1	3.3	2.9	3.8	3.7	3.2
Lumber, wood products, and furniture.....	24,25	1.3	1.3	1.4	(S)	(S)	1.5	1.6	3.3	2.3	2.9	3.4	3.6
Paper and allied products.....	26	6.0	6.1	6.4	8.5	(S)	10.7	10.6	10.6	10.6	11.0 (S)	11.2 (S)	10.4 (S)
Chemicals and allied products.....	28	75.2	75.8	78.3	80.4	81.6	85.6	86.5	93.1	99.6	94.3	89.0	89.5
Industrial chemicals.....	281-82,286	(S)	(S)	(S)	(S)	(S)	29.9	26.4	28.8	33.7	28.4	31.2	26.7
Drugs and medicines.....	283	32.6	33.0	34.4	34.3	35.4	38.7	42.3	48.5	50.3	49.0	43.1	45.3
Other chemicals.....	284-85,287-89	20.2	20.3	18.8	18.9	17.0	17.0	17.8	15.8	15.6	16.9	14.8	17.5
Petroleum refining and extraction.....	13,29	9.9	9.5	10.7	11.1	11.4	11.5	11.0	9.7	8.4	8.4	9.0	7.9
Rubber products.....	30	(S)	(S)	(S)	(S)	(S)	14.8	13.0	9.0	9.8	10.2	9.9	11.5
Stone, clay, and glass products.....	32	8.6	8.6	7.6	7.0	6.0	5.3	5.1	4.0	4.3	3.9	3.7	3.9 (S)
Primary metals.....	33	5.5	5.6	5.5	5.2	4.6	5.1	4.6	5.1	6.5	4.1	5.5 (S)	6.4 (S)
Ferrous metals and products.....	331-32,3398-99	(S)	2.3	2.3	(S)	(S)	1.7	1.6	2.6	1.9	1.6	1.6	4.0 (S)
Nonferrous metals and products.....	333-36	3.4	3.3	3.3	3.3	3.0	(S)	(S)	2.5	4.6	2.5	3.9 (S)	2.5
Fabricated metal products.....	34	9.9	10.5	9.9	10.1	(S)	8.7	7.9	10.2	9.2	9.1	10.0	12.8
Machinery.....	35	95.8	98.4	100.4	113.3	109.7	99.3	97.4	70.4	68.6	87.3	88.7	112.1
Office, computing, and accounting machines	357	73.4	74.4	75.0	84.7	77.6	67.1	65.8	34.6	31.8	33.7	45.3	66.1
Other machinery, except electrical.....	351-56,358-59	22.4	24.0	25.4	28.6	32.1	32.2	31.6	35.8	36.8	53.6	43.4	46.0
Electrical equipment.....	36	130.4	132.5	122.5	105.2	95.9	91.9	89.2	96.5	103.3	125.8	135.9	171.6
Radio and TV receiving equipment.....	365	1.2	1.3	1.5	0.8	1.0	1.0	1.0	0.8	0.9	1.3	1.6	1.2
Communication equipment.....	366	71.9	73.1	58.0	47.1	35.8	31.2	(S)	36.0 (S)	41.7 (S)	34.7 (S)	37.6 (S)	69.0
Electronic components.....	367	43.7	44.3	42.8	(S)	32.6	28.4	28.9	40.1	40.8	64.6 (S)	75.3 (S)	66.8 (S)
Other electrical equipment.....	361-64,369	13.6	(S)	(S)	21.3	(S)	31.2	28.8	19.6	20.0	25.3	21.4	34.6
Transportation equipment.....	37	187.3	188.2	185.4	170.2	149.7	141.1	147.5	129.6	120.8	156.6	161.8 (S)	144.1 (S)
Motor vehicles and motor vehicles equipment	371	46.5	47.3	45.8	49.4	45.3	44.5	45.1	51.0	51.1	57.0	63.8	64.1

See explanatory information and SOURCE at end of table.

Table A-52. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1987-98

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
		[In thousands]												
Distribution by industry:														
Other transportation equipment.....	373-75,379	(S)	(S)	(S)	(S)	(S)	(S)	(S)	5.8 (S)	6.2	4.0	3.4	3.1	
Aircraft and missiles.....	372,376	136.3	136.4	134.8	115.3	100.2	92.9	97.9	72.8	63.5	95.5	94.6 (S)	77.0 (S)	
Professional and scientific instruments.....	38	(S)	(S)	(S)	(S)	(S)	(S)	(S)	100.6 (S)	84.4	70.9 (S)	64.3 (S)	66.3 (S)	
Scientific and mechanical measuring instruments	381-82	(S)	(S)	(S)	(S)	(S)	(S)	(S)	66.4 (S)	63.2	48.2 (S)	42.6 (S)	43.7 (S)	
Optical, surgical, photographic, and other instruments.....	384-87	24.6	24.9	14.5	8.1	(S)	(S)	20.8	34.2	21.2	22.7	21.7	22.6	
Other manufacturing industries ¹	27,31,39	6.3	6.4	5.4	5.6	(S)	6.0	5.8	15.5	7.5	8.2	33.4	27.8	
Nonmanufacturing ²		96.4	101.9	125.2	(S)	(S)	202.6	196.5	197.4	198.9	226.6	245.8	269.5	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	NA	29.3	29.4	15.2	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	NA	25.4	24.7	8.4 (S)	
Telephone communications.....	481	NA	NA	NA	NA	NA	NA	NA	NA	NA	24.7	23.9	7.8 (S)	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.8	0.8	0.6	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.2 (S)	4.0 (S)	1.1	
Other transportation and utilities.....	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.7	0.8	5.7	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	NA	47.5	39.6	46.4	
Finance, insurance, and real estate.....	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.6	15.9	18.3 (S)	
Services.....	701,72,73,75-81, 83,84,87,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	139.6	143.9	168.7	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	NA	80.2	87.8	105.1	
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	NA	77.3	85.1	102.6	
Other business services.....	731-736, 738	NA	NA	NA	NA	NA	NA	NA	NA	NA	3.0	2.8	2.5	
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	NA	5.0	6.6	4.7	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.4	6.3	4.0	
Other health services.....	802-805,808-809	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.6	0.3 (S)	0.7	

See explanatory information and SOURCE at end of table.

Table A-52. Number of full-time-equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry and size of company: 1987-98

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	
		[In thousands]												
Distribution by industry:														
Engineering and management service	87	NA	NA	NA	NA	NA	NA	NA	NA	NA	52.9	45.3	54.5	
Engineering, architectural, and surveying	871	NA	NA	NA	NA	NA	NA	NA	NA	NA	22.8 (S)	18.0	20.9	
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	NA	28.8	24.9	28.3	
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.4	2.3 (S)	5.3	
Other services.....	701,72,75-79,81, 83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.5	4.2	4.4	
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	NA	4.6	17.0	20.8	
Distribution by size of company: [Number of employees]														
Total.....		695.8	708.6	722.5	743.6	773.4	779.3	764.7	768.5	746.1	832.8	885.7	951.5	
Fewer than 500.....		105.2	109.0	105.4	(S)	(S)	142.1	125.1	148.6	139.8	165.1	177.3	201.8	
500 to 999.....		18.4	19.3	18.0	18.6	18.6	46.2	46.1	27.9	29.7	36.6	37.7	41.3	
1,000 to 4,999.....		76.4	81.9	76.1	75.4	79.3	94.2	99.3	108.9	110.8	124.4	131.6	137.8	
5,000 to 9,999.....		40.5	40.2	47.3	57.2	55.1	57.6	56.4	60.3	52.8	61.1	82.2	100.6	
10,000 to 24,999.....		92.0	94.5	87.0	73.9	90.3	99.9	102.6	90.6	91.8	97.0	104.9	116.5	
25,000 or more.....		363.3	363.7	388.7	404.2	408.4	339.2	335.2	332.1	321.2	348.6	351.9 (S)	353.5 (S)	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

KEY: (S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-53. Number of full-time equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry, size of company, and source of R&D funds: January 1998

Page 1 of 2

Industry and size of company	SIC code	Total	Federal	Company
		[In thousands]		
All Industries.....		951.5	121.8 (S)	829.7
Distribution by industry:				
Manufacturing.....		682.1	101.6 (S)	580.5
Food, kindred, and tobacco products.....	20,21	11.0	0.0	11.0
Textiles and apparel.....	22,23	3.2	(D)	(D)
Lumber, wood products, and furniture.....	24,25	3.6	0.0	3.6
Paper and allied products.....	26	10.4 (S)	(D)	(D)
Chemicals and allied products.....	28	89.5	3.0 (S)	86.5
Industrial chemicals.....	281-82,286	26.7	(D)	(D)
Drugs and medicines.....	283	45.3	(D)	(D)
Other chemicals.....	284-85,287-89	17.5	(D)	(D)
Petroleum refining and extraction.....	13,29	7.9	(D)	(D)
Rubber products.....	30	11.5	(D)	(D)
Stone, clay, and glass products.....	32	3.9 (S)	0.0 (S)	3.9
Primary metals.....	33	6.4 (S)	(D)	(D)
Ferrous metals and products.....	331-32,3398-99	4.0 (S)	(D)	(D)
Nonferrous metals and products.....	333-36	2.5	(D)	(D)
Fabricated metal products.....	34	12.8	(D)	(D)
Machinery.....	35	112.1	0.8	111.3
Office, computing, and accounting machines...	357	66.1	(D)	(D)
Other machinery, except electrical.....	351-56,358-59	46.0	(D)	(D)
Electrical equipment.....	36	171.6	17.2 (S)	154.4
Radio and TV receiving equipment.....	365	1.2	(D)	(D)
Communication equipment.....	366	69.0	(D)	(D)
Electronic components.....	367	66.8 (S)	(D)	(D)
Other electrical equipment.....	361-64,369	34.6	(D)	(D)
Transportation equipment.....	37	144.1 (S)	58.1 (S)	86.0
Motor vehicles and motor vehicles equipment	371	64.1	(D)	(D)
Other transportation equipment.....	373-75,379	3.1	(D)	(D)
Aircraft and missiles.....	372,376	77.0 (S)	51.5 (S)	25.5 (S)
Professional and scientific instruments.....	38	66.3 (S)	20.2 (S)	46.1 (S)
Scientific and mechanical measuring instruments	381-82	43.7 (S)	19.8 (S)	23.9 (S)
Optical, surgical, photographic, and other instruments.....	384-87	22.6	0.4 (S)	22.2
Other manufacturing industries ¹	27,31,39	27.8	(D)	(D)
Nonmanufacturing.....		269.5	20.2	249.3
Transportation and utilities.....	40-42,44-49	15.2	(D)	(D)
Communications.....	48	8.4 (S)	(D)	(D)
Telephone communications.....	481	7.8 (S)	(D)	(D)
Other communications.....	482-484,489	0.6	0.0	0.6

See explanatory information and SOURCE at end of table.

Table A-53. Number of full-time equivalent (FTE) R&D scientists and engineers in R&D-performing companies, by industry, size of company, and source of R&D funds: January 1998

Page 2 of 2

Industry and size of company	SIC code	Total	Federal	Company
		[In thousands]		
Distribution by industry:				
Electric, gas, and sanitary services.....	49	1.1	(D)	(D)
Other transportation and utilities.....	40-42,44-47	5.7	(D)	(D)
Trade.....	50-59	46.4	0.1 (S)	46.3 (S)
Finance, insurance, and real estate.....	60-65,67	18.3 (S)	(D)	(D)
Services.....	701,72,73,75-81, 83,84,87,89	168.7	18.7	150.0
Business services.....	73	105.1	2.2	102.9
Computer and data processing services.....	737	102.6	(D)	(D)
Other business services.....	731-736,738	2.5	(D)	(D)
Health services.....	80	4.7	(D)	(D)
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	4.0	(D)	(D)
Other health services.....	802-805,808-809	0.7	(D)	(D)
Engineering and management services.....	87	54.5	16.4	38.1
Engineering, architectural, and surveying	871	20.9	10.3	10.6 (S)
Research, development, and testing.....	873	28.3	(D)	(D)
Other engineering and management services	872,874	5.3	(D)	(D)
Other services.....	701,72,75-79,81, 83, 84, 89	4.4	(D)	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	20.8	0.0 (S)	20.8
Distribution by size of company:				
[Number of employees]				
Total.....		951.5	121.8 (S)	829.7
Fewer than 500.....		201.8	6.5	195.3 (S)
500 to 999.....		41.3	2.3	39.0 (S)
1,000 to 4,999.....		137.8	5.2 (S)	132.6
5,000 to 9,999.....		100.6	4.6	96.0
10,000 to 24,999.....		116.5	6.3	110.2
25,000 or more.....		353.5 (S)	96.9 (S)	256.6

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.
(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-54. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1987-97

Page 1 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
		[Dollars]										
All Industries.....		128,800	132,300	134,500	141,300	148,600	157,912	153,336	157,459	167,339	168,362	171,495
Distribution by industry:												
Manufacturing.....		NA	NA	NA	NA	NA	NA	NA	163,508	173,523	179,538	183,097
Food, kindred, and tobacco products.....	20,21	(S)	(D)	(D)	(D)	130,000	144,215	135,261	152,494	167,017	154,853	166,821
Textiles and apparel.....	22,23	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Lumber, wood products, and furniture.....	24,25	(S)	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	99,055
Paper and allied products.....	26	(D)	(D)	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Chemicals and allied products.....	28	125,000	139,400	149,000	159,000	167,600	183,508	(D)	(D)	180,971	(D)	(D)
Industrial chemicals.....	281-82,286	(S)	(S)	(S)	(S)	181,000	193,871	(D)	(D)	(D)	(D)	(D)
Drugs and medicines.....	283	(D)	142,800	(D)	(D)	(D)	196,631	202,607	190,662	205,637	212,185	262,201
Other chemicals.....	284-85,287-89	(D)	105,600	(D)	(D)	(D)	135,423	(D)	(D)	(D)	158,355	(D)
Petroleum refining and extraction.....	13,29	187,400	182,700	194,000	201,800	217,000	205,318	208,360	202,587	209,495	189,981	(D)
Rubber products.....	30	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Stone, clay, and glass products.....	32	122,500	(D)	(D)	(D)	(D)	(D)	137,990	141,251	110,172	124,685	160,632 (S)
Primary metals.....	33	131,500	118,600	(S)	(D)	142,200	114,057	138,552	115,371	111,743	(D)	165,397 (S)
Ferrous metals and products.....	331-32, 3398-99	(D)	(S)	(D)	(D)	(D)	138,851	(D)	(D)	(D)	(D)	(D)
Nonferrous metals and products.....	333-36	(D)	(S)	(D)	(D)	(D)	138,326 (S)	(D)	(D)	(D)	(D)	(D)
Fabricated metal products.....	34	76,600	88,100	(S)	(S)	115,500	123,828	129,131	111,431	112,010	(D)	158,211
Machinery.....	35	(D)	(D)	130,000	138,500	147,800	152,797	100,631	(D)	(D)	152,894	184,263
Office, computing, and accounting machines.....	357	(D)	(D)	(D)	(D)	(D)	99,564	(D)	(D)	(D)	(D)	230,471
Other machinery, except electrical.....	351-56,358-59	98,300	99,400	(D)	(D)	(D)	102,213	112,692	111,421	(D)	(D)	126,651
Electrical equipment.....	36	124,300	124,100	132,400	142,800	147,100	150,118	144,725	152,615	163,626	171,907	159,879
Radio and TV receiving equipment.....	365	97,900	124,200	103,400	113,200	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Communication equipment.....	366	155,300	160,300	170,600	177,100	(S)	(D)	(D)	(D)	(D)	(D)	(D)
Electronic components.....	367	98,400	(S)	(S)	128,400	(D)	127,801	154,366	148,071	(D)	(D)	(D)
Other electrical equipment.....	361-64,369	(S)	68,500	(S)	(S)	(D)	(D)	(D)	(D)	(D)	(D)	175,531

See explanatory information and SOURCE at end of table.

Table A-54. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1987-97

Page 2 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars]											
Distribution by industry:													
Transportation equipment.....	37	183,400	195,600	211,700	215,700	189,400	191,274	196,777	216,686	233,968	205,665 (S)	209,164 (S)	
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Other transportation equipment....	373-75,379	(S)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	
Aircraft and missiles.....	372,376	180,400	193,300	207,300	213,700	177,000	180,552	176,450	186,898	213,328	170,733 (S)	189,972 (S)	
Professional and scientific instruments	38	(S)	(S)	(S)	(S)	(S)	(S)	115,180 (S)	146,585	154,251	179,723 (S)	206,112 (S)	
Scientific and mechanical measuring instruments.....	381-82	(D)	(S)	(S)	(S)	(S)	(S)	94,036 (S)	140,971	128,237	(D)	188,560 (S)	
Optical, surgical, photographic, and other instruments.....	384-87	(D)	316,700	(S)	(S)	(S)	(S)	161,721	159,723	220,383	(D)	240,293	
Other manufacturing industries ¹	27,31,39	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	(D)	91,458	
Nonmanufacturing ²		69,100	74,900	(S)	(S)	137,400	152,411	159,188	140,374	150,578	138,882	141,730	
Transportation and utilities.....	40-42,44-49	NA	NA	NA	NA	NA	NA	NA	NA	370,933	159,442	135,133	
Communications.....	48	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Telephone communications....	481	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Other communications.....	482-484,489	NA	NA	NA	NA	NA	NA	NA	NA	157,435	94,495	84,028	
Electric, gas, and sanitary services.....	49	NA	NA	NA	NA	NA	NA	NA	NA	274,704 (S)	98,427 (S)	(D)	
Other transportation and utilities..	40-42,44-47	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Trade.....	50-59	NA	NA	NA	NA	NA	NA	NA	NA	(D)	146,774	(D)	
Finance, insurance, and real estate	60-65,67	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	(D)	
Services.....	701,72,73, 75-81,83,84, 87,89	NA	NA	NA	NA	NA	NA	NA	NA	256,085	134,175	143,277	
Business services.....	73	NA	NA	NA	NA	NA	NA	NA	NA	231,680	126,625	123,974	
Computer and data processing services.....	737	NA	NA	NA	NA	NA	NA	NA	NA	234,483	(D)	124,766	
Other business services.....	731-736,738	NA	NA	NA	NA	NA	NA	NA	NA	158,453	(D)	95,896	

See explanatory information and SOURCE at end of table.

Table A-54. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1987-97

Page 3 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars]											
Distribution by industry:													
Health services.....	80	NA	NA	NA	NA	NA	NA	NA	NA	305,132	(D)	(D)	
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	NA	NA	NA	NA	NA	NA	NA	(D)	133,871 (S)	(D)	
Other health services.....	802-805, 808-809	NA	NA	NA	NA	NA	NA	NA	NA	(D)	(D)	100,372 (S)	
Engineering and management services.....	87	NA	NA	NA	NA	NA	NA	NA	NA	289,459	149,040	186,234	
Engineering, architectural, and surveying.....	871	NA	NA	NA	NA	NA	NA	NA	NA	257,067 (S)	81,271 (S)	104,608	
Research, development, and testing.....	873	NA	NA	NA	NA	NA	NA	NA	NA	(D)	204,445	(D)	
Other engineering and management services.....	872,874	NA	NA	NA	NA	NA	NA	NA	NA	(D)	93,929 (S)	(D)	
Other services.....	701,72,75-79, 81,83,84,89	NA	NA	NA	NA	NA	NA	NA	NA	221,147	(D)	(D)	
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	NA	NA	NA	NA	NA	NA	NA	NA	179,020	(D)	85,625	

See explanatory information and SOURCE at end of table.

Table A-54. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1987-97

Page 4 of 4

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
		[Dollars]											
Distribution by size of company: [Number of employees]													
Total.....		128,800	132,300	134,500	141,300	148,600	157,912	153,336	157,459	167,339	168,362	171,495	
Fewer than 500.....		66,800	67,100	66,200	(S)	103,400	111,358	106,888	97,012	109,319	118,280	126,925	
500 to 999.....		92,600	(S)	98,200	(S)	178,700	176,585	87,233	123,239	141,660	124,765	125,611	
1,000 to 4,999.....		91,900	100,600	101,900	91,400	119,400	127,135	128,565	134,558	144,213	142,747	145,436	
5,000 to 9,999.....		102,900	100,400	102,500	110,800	150,800	148,285	156,899	144,327	167,284	161,035	156,090	
10,000 to 24,999.....		132,700	143,000	127,300	135,300	167,300	156,190	160,229	172,678	180,849	199,722	194,323	
25,000 or more.....		157,700	160,700	168,200	193,700	180,100	182,839	184,804	193,002	200,606	199,286 (S)	207,375 (S)	

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

² Until 1995, data were not broken down below this level of detail for most nonmanufacturing industries.

[9]

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NA = Not available.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the R&D funds per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier year, and the ratio is attributed to the earlier year.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-55. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1997

Page 1 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars]					
All Industries.....		171,495	126,925	125,611	145,436	156,090	194,323	207,375 (S)
Manufacturing.....		183,097	107,371	119,645	155,418	179,821	196,310	211,428 (S)
Food, kindred, and tobacco products.....	20,21	166,821	140,858	85,143	122,705	135,993 (S)	206,231	240,244
Textiles and apparel.....	22,23	(D)	86,033	114,598	92,759	(D)	79,036 (S)	(D)
Lumber, wood products, and furniture.....	24,25	99,055	90,647	72,975	104,396	114,573 (S)	(D)	(D)
Paper and allied products.....	26	(D)	112,049	(D)	121,934	238,603 (S)	133,381 (S)	139,062 (S)
Chemicals and allied products.....	28	(D)	122,262	113,986	190,116	286,819	214,199	226,137
Industrial chemicals.....	281-82,286	(D)	67,060	112,931	203,794	251,014	210,418	(D)
Drugs and medicines.....	283	262,201	233,546	117,987	236,287	364,004	235,345	272,772
Other chemicals.....	284-85,287-89	(D)	101,561	111,875	99,621 (S)	137,690	(D)	(D)
Petroleum refining and extraction.....	13,29	(D)	32,757	(D)	222,952	(D)	181,123	211,995 (S)
Rubber products.....	30	(D)	71,782	116,322	156,676	90,391 (S)	191,615 (S)	(D)
Stone, clay, and glass products.....	32	160,632 (S)	50,354	127,983 (S)	89,078	180,095 (S)	209,185 (S)	0
Primary metals.....	33	165,397 (S)	95,717	63,257	155,831 (S)	270,034 (S)	164,806 (S)	(D)
Ferrous metals and products.....	331-32,3398-99	(D)	54,013	(D)	103,952 (S)	261,671 (S)	(D)	(D)
Nonferrous metals and products.....	333-36	(D)	115,109	61,819	221,876 (S)	(D)	(D)	(D)
Fabricated metal products.....	34	158,211	130,048	85,415	100,954	156,968	168,450	(D)
Machinery.....	35	184,263	152,341	114,764	148,858	104,896	207,846	(D)
Office, computing, and accounting machines.....	357	230,471	189,226	96,337	230,021	133,803	208,106	(D)
Other machinery, except electrical.....	351-56,358-59	126,651	130,061	121,857	106,835	88,458 (S)	207,212	(D)
Electrical equipment.....	36	159,879	109,740	125,463	141,748	213,514	160,180 (S)	169,198 (S)
Radio and TV receiving equipment.....	365	(D)	126,786	(D)	(D)	(D)	0	0
Communication equipment.....	366	(D)	98,491	134,441	100,257	178,108 (S)	(D)	(D)
Electronic components.....	367	(D)	144,173	130,813	175,045	280,349	208,593 (S)	(D)
Other electrical equipment.....	361-64,369	175,531	66,752	107,393	144,222	225,424	129,823	(D)

See explanatory information and SOURCE at end of table.

Table A-55. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1997

Page 2 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars]					
Transportation equipment.....	37	209,164 (S)	108,879	175,356 (S)	125,420	134,551	209,273	214,566 (S)
Motor vehicles and motor vehicles equipment.....	371	(D)	(D)	(D)	114,479	66,050 (S)	193,232	(D)
Other transportation equipment.....	373-75,379	(D)	(D)	(D)	(D)	(D)	(D)	(D)
Aircraft and missiles.....	372,376	189,972 (S)	(D)	(D)	172,351	194,519 (S)	(D)	189,829 (S)
Professional and scientific instruments.....	38	206,112 (S)	114,124	128,332	172,835	264,544	(D)	253,713 (S)
Scientific and mechanical measuring instruments.....	381-82	188,560 (S)	123,256	129,716	139,368	(D)	(D)	213,298 (S)
Optical, surgical, photographic, and other instruments.....	384-87	240,293	96,773	125,111	208,366	210,159	(D)	(D)
Other manufacturing industries ¹	27,31,39	91,458	81,690	80,714	135,255	145,926 (S)	(D)	54,963 (S)
Nonmanufacturing.....		141,730	140,246	135,111	123,918	97,973	187,421	171,370
Transportation and utilities.....	40-42,44-49	135,133	68,134	153,224	109,494	(D)	417,472	140,208
Communications.....	48	(D)	40,955	(D)	(D)	(D)	0	124,749 (S)
Telephone communications.....	481	(D)	0	(D)	0	(D)	0	124,604 (S)
Other communications.....	482-484,489	84,028	40,955	(D)	(D)	0	0	(D)
Electric, gas, and sanitary services.....	49	(D)	102,330	(D)	108,379	(D)	422,472	(D)
Other transportation and utilities.....	40-42,44-47	(D)	91,155	(D)	(D)	(D)	(D)	234,592
Trade.....	50-59	(D)	166,281	132,561	181,430	150,479	(D)	238,956
Finance, insurance, and real estate.....	60-65,67	(D)	102,163 (S)	(D)	100,060 (S)	122,163 (S)	(D)	42,829
Services.....	701,72,73,75-81, 83,84,87,89	143,277	149,105	137,212	110,725	79,154	169,814	(D)
Business services.....	73	123,974	114,446	101,790	126,360	82,666	(D)	292,608 (S)
Computer and data processing services.....	737	124,766	117,139	101,080	126,285	83,404	(D)	(D)
Other business services.....	731-736,738	95,896	26,375	121,607	129,573	38,466	(D)	230,542

See explanatory information and SOURCE at end of table.

Table A-55. R&D funds per R&D scientist or engineer in R&D-performing companies, by industry and size of company: 1997

Page 3 of 3

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[Dollars]					
Health services.....	80	(D)	36,927	6,394 (S)	107,065 (S)	(D)	(D)	0
Offices and clinics of medical doctors, hospitals, medical and dental labs....	801,806,807	(D)	32,932	(D)	(D)	0	(D)	0
Other health services.....	802-805,808-809	100,372 (S)	88,133	(D)	(D)	(D)	0	0
Engineering and management services.....	87	186,234	199,799	223,701	47,536 (S)	(D)	(D)	(D)
Engineering, architectural, and surveying.....	871	104,608	136,571	153,737	59,978 (S)	(D)	(D)	0
Research, development, and testing.....	873	(D)	229,443	280,532	(D)	0	(D)	(D)
Other engineering and management services.....	872,874	(D)	217,670	115,581 (S)	(D)	(D)	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	(D)	105,126	147,365	98,482	(D)	(D)	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	85,625	81,545	38,803	84,087 (S)	184,313	(D)	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier year, and the ratio is attributed to the earlier year.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-56. R&D funds per R&D scientist or engineer in R&D-performing companies ranked by size of R&D program: 1987-97

Companies ranked by size of R&D program	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
[Dollars]											
First 4.....	222,600	226,200	218,100	219,600	213,200	202,492	252,629	218,906	234,791	231,784	229,602 (S)
Next 4.....	196,900	210,700	225,800	249,000	223,700	238,950	199,559	245,626 (S)	188,928 (S)	185,032 (S)	180,389
Next 12.....	141,600	153,000	148,700	129,100	159,900	170,276	199,118	188,437	190,548	202,670	238,022 (S)
Next 20.....	146,300	154,500	132,500	145,800	(S)	(S)	(S)	182,699	204,159	210,552	213,496
Next 60.....	128,700	141,300	145,400	164,200	170,500	181,760	193,925	181,163	196,023	202,405	206,350
Next 100.....	128,600	137,300	141,900	137,000	169,000	173,101	138,227	174,524	162,707	160,560	155,255
Next 200.....	110,800	124,500	106,100	120,200	121,000	126,545	140,292	156,025	152,977	151,812	157,347
Average of above 400 R&D performing companies.....	153,100	160,600	161,500	161,200	169,000	158,098	154,814	174,536	167,339	168,362	171,495

KEY: (S) = Indicates imputation of more than 50 percent. Prior to 1993, data have been withheld.

NOTES: The number of full-time-equivalent R&D scientists and engineers used to estimate the cost per R&D scientist or engineer is the arithmetic mean of the numbers of R&D scientists and engineers reported for January in two consecutive years. This number is then divided into the total R&D expenditures of the earlier year, and the ratio is attributed to the earlier year.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-57. Domestic employment of R&D-performing companies, by industry and size of company: 1996-97

Page 1 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[In thousands]					
1996								
All Industries.....		18,102	1,831	806	2,838	2,041	2,734	7,852
Manufacturing.....		11,347	1,251	618	2,095	1,377	2,021	3,984
Food, kindred, and tobacco products.....	20,21	1,085	51	40	217	114	161	500
Textiles and apparel.....	22,23	430	53	(D)	105	59	141	(D)
Lumber, wood products, and furniture.....	24,25	331	45	(D)	74	67	(D)	(D)
Paper and allied products.....	26	560	18	7	100	41	155	239
Chemicals and allied products.....	28	1,049	64	38	198	168	281	301
Industrial chemicals.....	281-82,286	444	19	20	75	61	129	140
Drugs and medicines.....	283	304	6	(D)	53	40	105	(D)
Other chemicals.....	284-85,287-89	301	38	(D)	70	67	47	(D)
Petroleum refining and extraction.....	13,29	286	10	(D)	17	(D)	133	121
Rubber products.....	30	453	67	57	145	(D)	58	(D)
Stone, clay, and glass products.....	32	190	21	10	67	33	60	0
Primary metals.....	33	406	42	10	68	96	88	102
Ferrous metals and products.....	331-32,3398-99	208	26	(D)	42	63	(D)	(D)
Nonferrous metals and products.....	333-36	198	16	(D)	26	33	(D)	(D)
Fabricated metal products.....	34	604	121	(D)	139	65	157	(D)
Machinery.....	35	1,322	197	77	399	183	279	186
Office, computing, and accounting machines.....	357	278	15	(D)	26	44	65	(D)
Other machinery, except electrical.....	351-56,358-59	1,044	182	(D)	373	140	214	(D)
Electrical equipment.....	36	1,388	170	115	269	133	210	491
Radio and TV receiving equipment.....	365	29	8	4	10	(D)	0	0
Communication equipment.....	366	231	33	20	54	(D)	(D)	(D)
Electronic components.....	367	551	69	49	108	48	(D)	(D)
Other electrical equipment.....	361-64,369	576	60	42	97	45	116	217

See explanatory information and SOURCE at end of table.

Table A-57. Domestic employment of R&D-performing companies, by industry and size of company: 1996-97

Page 2 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[In thousands]					
1996								
Transportation equipment.....	37	1,948	22	39	58	231	131	1,468
Motor vehicles and motor vehicles equipment.....	371	959	(D)	(D)	23	55	87	744
Other transportation equipment.....	373-75,379	284	(D)	0	19	(D)	(D)	85
Aircraft and missiles.....	372,376	705	6	(D)	17	(D)	(D)	639
Professional and scientific instruments.....	38	608	98	(D)	152	71	(D)	219
Scientific and mechanical measuring instruments.....	381-82	294	50	28	57	20	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	314	48	(D)	95	51	(D)	(D)
Other manufacturing industries.....	27,31,39	686	273	48	85	62	91	128
Nonmanufacturing		6,755	580	188	743	664	713	3,868
Transportation and utilities.....	40-42,44-49	2,017	17	3	140	147	191	1,518
Communications.....	48	826	5	(D)	(D)	(D)	0	(D)
Telephone communications.....	481	815	0	0	0	(D)	0	(D)
Other communications.....	482-484,489	11	5	(D)	(D)	0	0	0
Electric, gas, and sanitary services.....	49	593	5	(D)	127	132	(D)	167
Other transportation and utilities.....	40-42,44-47	599	8	0	9 (S)	(D)	(D)	542
Trade.....	50-59	1,577	166	75	163	238	87	849
Finance, insurance, and real estate.....	60-65,67	724	12	2	163	81	(D)	(D)
Services.....	701,72,73,75-81, 83,84,87,89	2,219	312	92	239	151	393	1,033
Business services.....	73	1,422	161	70	139	119	143	790
Computer and data processing services.....	737	540	143	65	113	50	(D)	(D)
Other business services.....	731-736,738	882	17	5	26	69	(D)	(D)
Health services.....	80	91	15	(D)	13	(D)	50	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	74	14	(D)	(D)	0	50	0
Other health services.....	802-805,808-809	17 (S)	2	(D)	(D)	(D)	0	0

See explanatory information and SOURCE at end of table.

Table A-57. Domestic employment of R&D-performing companies, by industry and size of company: 1996-97

Page 3 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[In thousands]					
1996								
Engineering and management services.....	87	507	123	(D)	67	(D)	76	(D)
Engineering, architectural, and surveying.....	871	140	41	(D)	43	(D)	44	0
Research, development, and testing.....	873	302	53	(D)	5	0	(D)	(D)
Other engineering and management services.....	872,874	65	29	(D)	19	0	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	199	13	2	20	(D)	123	(D)
Other nonmanufacturing industries	07-12,14,15, 161-162,17	218	73	15	38	46	(D)	(D)
1997								
All Industries.....		20,221	1,975	790	2,860	2,254	3,188	9,154
Manufacturing.....		11,700	1,235	626	2,090	1,403	2,170	4,176
Food, kindred, and tobacco products.....	20,21	1,217	67	91	245	120	229	465
Textiles and apparel.....	22,23	384	40	(D)	112	21	112	(D)
Lumber, wood products, and furniture.....	24,25	252	20	41	68	65	59	0
Paper and allied products.....	26	547	16	2 (S)	84	48	162	235
Chemicals and allied products.....	28	1,019	72	23	205	195	276	248
Industrial chemicals.....	281-82,286	411	16	(D)	86	83	109	(D)
Drugs and medicines.....	283	316	23	2	54	49	89	99
Other chemicals.....	284-85,287-89	292	33	(D)	64	63	78	(D)
Petroleum refining and extraction.....	13,29	241	1	2	33	0	114	90
Rubber products.....	30	475	73	62	149	(D)	67	(D)
Stone, clay, and glass products.....	32	163	10	8	31	33	81	0
Primary metals.....	33	494	12	34	82	122	143	102
Ferrous metals and products.....	331-32,3398-99	301	2	2	41	101	(D)	(D)
Nonferrous metals and products.....	333-36	193	10	32	41	21 (S)	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-57. Domestic employment of R&D-performing companies, by industry and size of company: 1996-97

Page 4 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[In thousands]					
1997								
Fabricated metal products.....	34	681	127	(D)	160	64	171	(D)
Machinery.....	35	1,387	204	74	324	204	275	305
Office, computing, and accounting machines.....	357	419	20	(D)	44	61	83	(D)
Other machinery, except electrical.....	351-56,358-59	968	184	(D)	281	144	193	(D)
Electrical equipment.....	36	1,586	167	99	287	235	195	604
Radio and TV receiving equipment.....	365	14	3	(D)	10	0	0	(D)
Communication equipment.....	366	378	37	(D)	49	116	0	(D)
Electronic components.....	367	491	83	42	96	69	86	(D)
Other electrical equipment.....	361-64,369	703	44	37	132	50	109	331
Transportation equipment.....	37	1,834	40	42	54	101	134	1,463
Motor vehicles and motor vehicles equipment.....	371	1,023	(D)	39	18	(D)	102	766
Other transportation equipment.....	373-75,379	87	0	(D)	13	(D)	(D)	(D)
Aircraft and missiles.....	372,376	725	(D)	(D)	23	38	(D)	(D)
Professional and scientific instruments.....	38	676	90	40	158	72	43	272
Scientific and mechanical measuring instruments.....	381-82	381	64	26	57	26	(D)	(D)
Optical, surgical, photographic, and other instruments.....	384-87	295	26	15	101	46	(D)	(D)
Other manufacturing industries ¹	27,31,39	743	296	32	97	77	109	132
Nonmanufacturing.....		8,521	740	164	770	851	1,018	4,978
Transportation and utilities.....	40-42,44-49	3,980	15	4	142	438	166	3,215
Communications.....	48	1,109	2	(D)	5	314	0	(D)
Telephone communications.....	481	1,050	0	0	0	314	0	736
Other communications.....	482-484,489	59	2	(D)	5	0	0	(D)
Electric, gas, and sanitary services.....	49	525	3	(D)	128	(D)	(D)	(D)
Other transportation and utilities.....	40-42,44-47	2,346	11	(D)	8 (S)	(D)	(D)	2,290
Trade.....	50-59	1,655	272	10	162	137	508	567
Finance, insurance, and real estate.....	60-65,67	584	33	(D)	62	68	(D)	(D)

See explanatory information and SOURCE at end of table.

Table A-57. Domestic employment of R&D-performing companies, by industry and size of company: 1996-97

Page 5 of 5

Industry	SIC code	Total	Size of company					
			Fewer than 500 employees	500 to 999 employees	1,000 to 4,999 employees	5,000 to 9,999 employees	10,000 to 24,999 employees	25,000 or more employees
			[In thousands]					
1997								
Services.....	701,72,73,75-81, 83,84,87,89	2,036	319	118	358	141	288	812
Business services.....	73	1,318	172	56	139	97	76	777
Computer and data processing services.....	737	510	163	(D)	108	65	(D)	90 (S)
Other business services.....	731-736,738	807	9	(D)	32	32	(D)	687
Health services.....	80	109	16	2	36	0	55	0
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	97	14	2	27	0	55	0
Other health services.....	802-805,808-809	12	3	0	9	0	0	0
Engineering and management services.....	87	325	108	29	50	(D)	83	(D)
Engineering, architectural, and surveying.....	871	148	47	(D)	39	(D)	47	0
Research, development, and testing.....	873	98	51	9	3	0	(D)	(D)
Other engineering and management services.....	872,874	79	10	11	8	(D)	(D)	0
Other services.....	701,72,75-79,81, 83,84,89	284	23	31	133	(D)	74	(D)
Other nonmanufacturing industries ¹	07-12,14,15, 161-162,17	266	101	(D)	46	67	(D)	(D)

¹ Beginning in 1996, manufacturing companies with fewer than 50 employees and nonmanufacturing companies with fewer than 15 employees were sampled separately without regard to industry classification to minimize year-to-year variation in survey estimates. Estimates for manufacturing companies in this group are combined with those for companies in "Other manufacturing industries." Estimates for nonmanufacturing companies in this group are combined with those for companies in "Other nonmanufacturing industries." As a result, statistics for "Other manufacturing industries" and for "Other nonmanufacturing industries" after 1995 are not comparable with statistics for prior years.

KEY: (D) = Data have been withheld to avoid disclosing operations of individual companies.

(S) = Indicates imputation of more than 50 percent.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-58. R&D scientists and engineers per 1,000 employees in R&D-performing companies, by industry and size of company: 1987-97

Page 1 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
All Industries ¹		NA	44	47	49	47						
Distribution by industry:												
Manufacturing.....		45	46	46	47	50	51	52	47	54	56	58
Food, kindred, and tobacco products.....	20,21	7	8	8	8	9	9	9	8	10	10	9
Textiles and apparel.....	22,23	4	(S)	(S)	6	7	8	7	7	10	9	8
Lumber, wood products, and furniture.....	24,25	5	5	5	6	5	6	16	7	12	10	14
Paper and allied products.....	26	11	11	13	16	17	19	19	15	20 (S)	20	19 (S)
Chemicals and allied products.....	28	68	69	69	69	69	71	80	84	78	85	88
Industrial chemicals.....	281-82,286	52	54	56	59	60	61	58	63	67	70	65
Drugs and medicines.....	283	98	94	92	96	95	116	138	141	141	142	143
Other chemicals.....	284-85,287-89	61	60	60	53	53	43	51	53	38	49	60
Petroleum refining and extraction.....	13,29	20	24	26	26	26	27	27	23	26	32	33
Rubber products.....	30	19	(S)	26	32	38	33	24	21	21	22	24
Stone, clay, and glass products.....	32	24	26	26	24	24	23	21	19	22	19	24 (S)
Primary metals.....	33	12	12	12	11	11	11	11	14	9	14	13 (S)
Ferrous metals and products.....	331-32,3398-99	9	9	8	7	7	7	9	7	6	8	13 (S)
Nonferrous metals and products.....	333-36	16	17	16	15	(S)	(S)	15	23	12	20	13
Fabricated metal products.....	34	17	17	(S)	20	19	16	21	15	15	17	19
Machinery.....	35	67	66	71	73	74	74	61	59	75	67	81
Office, computing, and accounting machines.....	357	115	114	126	131	137	139	124	157	173	163	158
Other machinery, except electrical.....	351-56,358-59	29	29	31	33	36	37	41	39	55	42	47
Electrical equipment.....	36	65	71	68	66	67	65	75	75	91	98	108
Radio and TV receiving equipment.....	365	45	45	44	30	30	28	51	43	56	55	87
Communication equipment.....	366	73	94	96	89	91	(S)	(S)	153 (S)	147 (S)	163 (S)	182
Electronic components.....	367	86	100	96	89	95	92	122	104	142 (S)	137	136 (S)
Other electrical equipment.....	361-64,369	28	26	30	38	43	44	31	29	38	37	49
Transportation equipment.....	37	68	72	71	68	73	76	70	68	78	83	79 (S)
Motor vehicles and motor vehicles equipment.....	371	42	41	41	43	49	51	54	50	53	67	63
Other transportation equipment.....	373-75,379	38	40	52	45	(S)	(S)	(S)	43	26	12	35
Aircraft and missiles.....	372,376	91	103	101	96	98	101	94	108	121	134	106 (S)

See explanatory information and SOURCE at end of table.

Table A-58. R&D scientists and engineers per 1,000 employees in R&D-performing companies, by industry and size of company: 1987-97

Page 2 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Distribution by industry:												
Professional and scientific instruments.....	38	71	62	59	71	(S)	(S)	(S)	99	100 (S)	106	98 (S)
Scientific and mechanical measuring instruments.....	381-82	85	84	96	95	(S)	(S)	(S)	127	135 (S)	145	115 (S)
Optical, surgical, photographic, and other instruments.....	384-87	63	48	28	17	(S)	59	98	60	64	69	77
Other manufacturing industries	27,31,39	18	17	14	14	14	14	32	14	16	49	37
Nonmanufacturing ¹		NA	36	35	36	32						
Transportation and utilities.....	40-42,44-49	NA	14	15	4							
Communications.....	48	NA	28	30	8 (S)							
Telephone communications.....	481	NA	28	29	7 (S)							
Other communications.....	482-484,489	NA	96	74	10							
Electric, gas, and sanitary services.....	49	NA	6 (S)	7	2							
Other transportation and utilities.....	40-42,44-47	NA	1	1	2							
Trade.....	50-59	NA	25	25	28							
Finance, insurance, and real estate.....	60-65,67	NA	13	22	31 (S)							
Services.....	701,72,73,75-81, 83,84,87,89	NA	75	65	83							
Business services.....	73	NA	64	62	80							
Computer and data processing services.....	737	NA	149	158	201							
Other business services.....	731-736,738	NA	4	3	3							
Health services.....	80	NA	35	73	43							
Offices and clinics of medical doctors, hospitals, medical and dental labs.....	801,806,807	NA	38	85	41							
Other health services.....	802-805,808-809	NA	24	17	59							
Engineering and management services.....	87	NA	163	89	168							
Engineering, architectural, and surveying.....	871	NA	113 (S)	129	142							
Research, development, and testing.....	873	NA	392	82	289							
Other engineering and management services.....	872,874	NA	28	36	67							

See explanatory information and SOURCE at end of table.

Table A-58. R&D scientists and engineers per 1,000 employees in R&D-performing companies, by industry and size of company: 1987-97

Page 3 of 3

Industry and size of company	SIC code	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Other services.....	701,72,75-79,81, 83,84,89	NA	10	21	16							
Other nonmanufacturing industries	07-12,14,15, 161-162,17	NA	14	78	78							
Distribution by size of company: [Number of employees]												
Total ¹		NA	44	47	49	47						
Fewer than 500.....		NA	60	85	97	102						
500 to 999.....		NA	42	44	47	52						
1,000 to 4,999.....		NA	41	45	46	48						
5,000 to 9,999.....		NA	31	32	40	45						
10,000 to 24,999.....		NA	31	37	38	37						
25,000 or more.....		NA	48	45	45	39 (S)						

¹ Until 1995, this table included only manufacturing companies.

173

KEY: (S) = Indicates imputation of more than 50 percent. For years prior to 1993, data have been withheld.
 NA = Not available.

NOTES: The number of R&D scientists and engineers per 1,000 employees for 1995 is derived by dividing the arithmetic mean of scientists and engineers employed in January 1995 and January 1996 by the number of employees in all activities in March 1995. Similar procedures were used for earlier years.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. As a result of the new sample design, statistics for 1991 and later years are not directly comparable with statistics for 1990 and earlier years. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-59. R&D funds per employee in R&D-performing companies, by size of company: 1987-97

Size of company [Number of employees]	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
Total (company, Federal, and other) R&D funds per employee											
Total.....	5,338	5,594	5,920	6,291	6,842	7,366	7,225	6,945	7,439	7,992	7,791
Fewer than 500.....	5,553	5,377	5,660	6,339	7,279	7,493	8,718	6,041	8,611	11,056	12,183
500 to 999.....	3,121	2,906	3,197	3,826	(T)	14,206	5,184	5,043	5,620	5,755	6,287
1,000 to 4,999.....	3,395	3,223	3,404	3,738	4,243	4,907	5,046	5,377	6,201	6,439	6,849
5,000 to 9,999.....	3,210	3,992	4,158	4,456	4,706	5,253	5,379	4,771	4,975	5,652	6,331
10,000 to 24,999.....	3,668	3,713	3,607	4,401	5,223	5,468	5,294	5,406	6,445	7,375	6,747
25,000 or more.....	7,035	7,388	7,863	8,005	8,252	8,908	9,123	9,305	8,738	8,890	7,990
Company and other (except Federal) R&D funds per employee											
Total.....	3,562	3,844	3,607	4,401	5,322	5,839	5,834	5,682	6,118	6,685	6,608
Fewer than 500.....	4,811	4,782	5,201	5,701	6,242	6,384	7,828	5,559	7,589	9,800	11,065
500 to 999.....	2,859	2,677	3,029	3,598	(T)	13,937	4,871	4,792	5,350	5,484	5,810
1,000 to 4,999.....	2,799	2,761	2,990	3,346	3,817	4,488	4,623	5,094	5,910	6,259	6,660
5,000 to 9,999.....	2,682	3,335	3,624	4,286	4,228	4,764	4,935	4,625	4,848	5,423	6,059
10,000 to 24,999.....	2,969	3,163	3,217	3,863	4,106	4,282	4,400	4,622	5,710	6,998	6,461
25,000 or more.....	4,010	4,402	5,016	5,251	5,739	6,404	6,691	6,783	6,363	6,455	5,884

KEY: (T) = Data not separately available.

NOTES: Averages were derived by dividing total and company R&D funds for a calendar year by employment data for March of that year.

As a result of a new sample design, statistics for 1988-91 have been revised since originally published. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997

Table A-60. Concentration of total employment in R&D-performing companies ranked by size of R&D program: 1987-97

Companies ranked by size of R&D program	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
	[Percent]										
First 4 (1-4).....	7	7	7	7	7	7	6	6	6	6	5
Next 4 (5-8).....	4	3	3	3	3	3	2	2	2	2	2
Next 12 (9-20).....	6	6	6	5	5	5	5	4	4	4	3
Next 20 (21-40).....	6	5	4	5	4	4	4	4	4	4	4
Next 60 (41-100).....	8	9	10	9	9	8	8	7	7	7	6
Next 100 (101-200).....	7	8	8	8	10	9	9	8	7	8	6
Next 200 (201-400).....	9	9	9	11	10	10	10	9	9	9	11
All others.....	53	53	53	52	52	47	55	59	61	59	63

NOTE: As a result of a new sample design, statistics for 1988-91 have been revised. These statistics now better reflect R&D performance among firms in the nonmanufacturing industries and small firms in all industries. See the technical notes for more information.

SOURCE: National Science Foundation/Division of Science Resources Studies, Survey of Industrial Research and Development: 1997